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48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 10.

REPORTS OF DISBURSING OFFICERS OF THE WAR DEPARTMENT.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

Reports of disbursing officers, to accompany annual report of the Inspector-General for the year 1884.

DECEMBER 3, 1884.—Referred to the Committee on Expenditures in the War Department and ordered to be printed.

WAR DEPARTMENT,
Washington City, December 2, 1884.

The Secretary of War has the honor to transmit to the House of Representatives reports of inspection of money accounts of disbursing officers, to accompany the annual report of the Inspector-General of the Army for the year 1884.

ROBERT T. LINCOLN,
Secretary of War.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 11.

ZUNI INDIAN RESERVATION IN NEW MEXICO AND ARIZONA.

LETTER

FROM

THE SECRETARY OF THE INTERIOR,

TRANSMITTING,

In response to a resolution of the House of Representatives of June 24, 1884, reports from the office of Indian Affairs and the General Land Office, with accompanying papers, relating to alleged claims to portions of the Zuni Indian reservation in New Mexico and Arizona; also transmitting copies of letters from the Department of the Interior to Hon. John A. Logan, in reference to amending the order setting apart said reservation.

DECEMBER 3, 1884.—Referred to the Committee on Indian Affairs and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, December 2, 1884.

SIR: I have the honor to acknowledge the receipt of the following resolution of the House of Representatives of June 24, 1884:

Resolved, That the Secretary of the Interior be requested to furnish the House of Representatives with copies of all reports, correspondence, and other papers on file in the Interior Department relating to the alleged claims of any persons to a portion of the lands of the Zuni Indian reservation in the Territories of New Mexico and Arizona, and the restoration of such lands to said reservation, and also to inform the House what action the Department has taken in the premises.

In response to the said resolution, I have the honor to transmit herewith copies of reports from the office of Indian Affairs and the General Land Office, to which the subject was referred, dated respectively July 12, 1884, and November 22, 1884, with the accompanying papers referred to therein comprising the information requested.

I also inclose copies of two letters from this Department of July 2, 1884, addressed to Hon. John A. Logan, United States Senate.

The Department letter of April 28, 1883, to the President, submitting for his approval draft of an Executive order amending the previous order setting apart the Zuni Reservation, and the letters of July 2, 1884, to Hon. John A. Logan, show the action taken by this Department on the subject.

Very respectfully,

H. M. TELLER,
Secretary.

The SPEAKER *of the House of Representatives.*

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, D. C., July 12, 1884.

SIR: I have the honor to acknowledge the receipt, by your reference the 26th ultimo, of a resolution of the House of Representatives of the 24th ultimo, as follows:

Resolved, That the Secretary of the Interior be requested to furnish the House of Representatives with copies of all reports, correspondence, and other papers on file in the Interior Department, relating to the alleged claims of any persons to a portion of the lands of the Zuni Indian reservation in the Territories of New Mexico and Arizona, and the restoration of such lands to said reservation, and also to inform the House what action the Department has taken in the premises.

Agreeably with the request contained in said resolution, I have the honor to transmit herewith copies of all official reports, correspondence, and other papers upon the subject-matter referred to, contained in the records and files of this office. No action has been taken by this office other than as disclosed by these papers.

The papers should be examined in the order in which they are numbered.

The House resolution is herewith returned.

Very respectfully, your obedient servant,

H. PRICE,
Commissioner.

The Hon. the SECRETARY OF THE INTERIOR.

1.

DEPARTMENT OF THE INTERIOR,
OFFICE OF UNITED STATES INDIAN INSPECTOR,
In the Field, Las Cruses, N. Mex., February 8, 1883.

SIR: I have the honor to invite your notice to the fact that there seems to be homestead and "desert land" entries upon the Zuni Reservation. For example, T. 12 N., R. 17 W., Secs. 25, 26, 35, 36, and 34; also, T. 11 N., R. 17 W., Secs. 2, 3, and 4.

The latter three are evidently within the reservation, though on the plat open at the land office for filing claims upon.

My purpose is to ask a survey of the reservation, and that it be marked, and that the land office be directed to withdraw the doubtful sections from their list for the time being.

I would respectfully suggest that the district commander be requested to designate an Army officer for this duty, and that the agent be directed to employ Indians for the marking.

Moreover, as the President's proclamation (1868) was intended to include the farms cultivated by the Indians for many years, and, for this purpose, a point on the "mountain above Nutria Springs" was designated as a limit, besides stating the distance, approximately, as 30 miles, I would recommend that said designated point in the boundary be strictly adhered to. Otherwise the Zunis will be deprived of land they and their ancestors have farmed for many years.

It will be necessary that the honorable Secretary give directions explicitly as to this matter of the point to which the northern boundary line shall be extended, because the plats of the land office and the instructions based on them ignore the fact of any such designation by the President.

Very respectfully,

C. H. HOWARD,
United States Indian Inspector.

Hon. H. M. TELLER,
Secretary of the Interior.

[Indorsement.]

DEPARTMENT OF THE INTERIOR,
Washington, February 21, 1883.

Respectfully referred to the Commissioner of Indian Affairs for report.

M. L. JOSLYN,
Assistant Secretary.

2.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, March 1, 1884.

SIR: I have the honor to return herewith letter of Inspector Howard, dated February 8 (ultimo), referred here by the Department on the 21st for remark.

Said letter relates to the improper entry of lands within the Zuni Indian reservation in New Mexico, under the homestead laws and "desert-land" act.

Upon informal inquiry at the General Land Office, I learn that the surveyor-general of New Mexico has been instructed (by telegraph) to withdraw the plats of such townships as may possibly fall within the Zuni Reservation either wholly or in parts.

It seems highly important that the out-boundaries of the reservation be surveyed and marked at the earliest possible moment, and as there are no funds at the disposal of this office for that purpose, I would respectfully recommend that the General Land Office be directed to have the exterior lines run and properly marked in connection with, and as incidental to, the survey of the public lands adjacent to said reservation.

It appears to me there would be impropriety in this, but if for any reason the survey cannot be executed in that manner, I shall have further recommendation to make in the premises.

Very respectfully, your obedient servant,

H. PRICE,
Commissioner.

The Hon. SECRETARY OF THE INTERIOR.

3.

DEPARTMENT OF THE INTERIOR,
Washington, March 9, 1883.

SIR: Referring to your report of 1st instant (Land 3606—1883), touching the survey of the boundaries of the Zuni Reservation in the Territory of New Mexico, I inclose herewith for your information a letter of 8th instant from the Commissioner of the General Land Office, in relation to the subject, with copy of Department letter of reply, of this date.

Very respectfully,

H. M. TELLER
Secretary.

The COMMISSIONER OF INDIAN AFFAIRS.

4.

DEPARTMENT OF THE INTERIOR,-
GENERAL LAND OFFICE,
Washington, D. C., March 8, 1883.

SIR: I have the honor to acknowledge the receipt, by reference from the Department for report, of copy of a letter from C. H. Howard, United States Indian inspector, dated February 8, 1883, stating that some homestead and desert-land entries had recently been made of lands in T. 12 N., R. 17 W., and T. 11 N., R. 17 W., New Mexico meridian, falling within the Zuni Indian reservation, declared by Executive order dated March 16, 1877.

I have also received by Departmental reference a letter from the Commissioner of Indian Affairs dated March 1, 1883, returning letter of Inspector Howard, and recommending that this office be directed to run the exterior lines of Zuni Indian reservation in connection with the survey of adjacent public lands. The Indian inspector suggests that the district commander be requested to designate an Army officer to make a survey of the boundaries of the reservation, and mark the same on the ground, and that the United States land officers be directed to withdraw the sections of land which may be supposed to fall within the said reservation.

In reply I have the honor to report that a few days since it was discovered in this office that portions of certain townships recently surveyed in New Mexico might fall within the limits of said reservation, which has never been surveyed. Immediately

upon said discovery being made, viz, on February 13, 1883, a telegram was sent to the United States surveyor-general at Santa Fé to withdraw from the United States local land office the plats of T. 11 and 12 N., R. 16 and 17 W., and T. 11 N., R. 17 W., supposed to have been filed at Santa Fé about January 26.

These plats will cover all possible interferences with said reservation.

Under date of the 23d ultimo the surveyor-general reports that while his deputy was in the field he sent him instructions to establish so much of the reservation boundary as his work closes upon, and, if necessary, to run the entire north boundary and part of the east boundary of the reservation for that purpose. He does not know whether the deputy received his instructions, but will ascertain.

The surveyor-general says the reservation was overlooked in the press of office work when the returns were received. He now submits instructions requiring the deputy to return to the field and establish so much of the reservation boundary as is necessary to close the subdivisional surveys made by him, upon said boundary, and obliterate the corners within the reservation, said work to be done at his expense if it is found that he had knowledge of the existence of the reservation.

In regard to the suggested survey by the military authorities, I would state that such a survey if made would not be authoritative, and it would still be necessary to have a survey made under the direction of this office in order to close the lines of public surveys thereon, and show the fractions of legal subdivisions adjacent to the reservation. This office has no fund with which to make the survey of Indian reservation boundaries *only*, but as it is necessary to have said boundaries surveyed to segregate the public from the Indian lands, I would state that it is the opinion of this office that the appropriation for the survey of public lands may be used in this case to survey said boundary lines, as necessary to segregate the Indian from the public lands, and in order to close the public surveys upon the boundary.

If, therefore, it shall not appear that it is the said surveyor's duty to make a survey of any part of said boundaries at his expense, I recommend that this office be authorized to contract for said survey, and the closing of the public surveys thereon, paying for the work out of the appropriation for public surveys.

The distance to be surveyed and marked is a little over 70 miles.

The letters received from the Department, with their inclosures, are herewith returned.

Very respectfully,

N. C. McFARLAND,
Commissioner.

Hon. H. M. TELLER,
Secretary of the Interior.

5.

DEPARTMENT OF THE INTERIOR,
Washington, March 9, 1883.

SIR: Referring to the recommendation contained in your letter of the 8th instant, touching homestead and desert-land entries within the boundaries of the Zuni Indian reservation in New Mexico, as defined in Executive order of March 16, 1877, you are informed that if it shall appear from investigation that it is not the duty of the deputy surveyor to make a survey of any part of the said boundaries of said reservation at his own expense (growing out of neglect of orders issued to him by competent authority), then your office is authorized to enter into contract in the usual manner for said survey and the closing of the public surveys thereon, paying for the work out of the appropriation within the control of your office applicable to such purpose.

Very respectfully,

H. M. TELLER,
Secretary.

The COMMISSIONER OF THE GENERAL LAND OFFICE.

6.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, April 5, 1883.

SIR: Under date of February 8, 1883, Inspector Howard reported to the Department that certain entries had recently been made of lands in T. 12 N., R. 17 W., and T. 11 N., R. 17 W., New Mexico meridian, falling within the Zuni Indian reservation.

The matter having been referred to this office for remark, it was ascertained by in-

formal inquiry at the General Land Office that the surveyor-general of New Mexico had been instructed to withdraw the plats of such townships as may possibly fall within the said reservation.

Arrangements have now been made for the survey of the boundaries of the said reservation in order to segregate the public from the Indian lands.

I inclose herewith a copy of a report to the Department by the Commissioner of the General Land Office, dated March 8, 1883, and also copy of Department instructions in reply thereto, dated March 9, 1883, by which you will see just what action has been taken in the premises.

Very respectfully,

H. PRICE,
Commissioner.

B. M. THOMAS, Esq.,
United States Indian Agent, Pueblo Agency, Sante Fé, N. Mex.

[For inclosures referred to above, see foregoing letters from General Land Office and Department of dates mentioned.]

7.

UNITED STATES INDIAN SERVICE,
PUEBLO INDIAN AGENCY,
Santa Fé, N. Mex., April 12, 1883.

SIR: I have the honor to acknowledge receipt of your letter of April 5, marked L. 3606, 1883, inclosing letters of the honorable Secretary of the Interior and Commissioner of the General Land Office, in regard to entries recently made on the Zuni Reservation. The action taken as shown by the inclosures does not reach the real difficulty by any means. The difficulty lies in the manner of regarding the reservation, as shown on the maps, resulting in the contradiction of terms in the description of the boundaries of the reservation. "Beginning at the one hundred and thirty sixth mile-stone on the western boundary line of the Territory of New Mexico and running thence north 61° 45′ east * * * " does not run the line (that northern) of the reservation "to the crest of the mountain a short distance above Nutria Spring," but leaves out that spring and the Nutria farms which the Indians have cultivated from time immemorial and which are necessary to their support. The intention of the reservation was to secure to the Zunis three principal farming districts where they raise their means of subsistence, viz, Nutria, Pescado, and Ojo Caliente; but in making the original description of the boundaries I was misled by the surveyor who had surveyed the territorial boundary line and who was with me at the time I located the reservation. He assured me that the angle "north 61° 45′ east" would run the line so as to take in Nutria; but it seems that it does not. The outrage of taking Nutria from the Zunis *must not be consummated.* The thing to do is to follow the apparent intent of the description and run the north line to the crest of the mountain above Nutria, regardless of the angle given, and then run the eastern line far enough south to take in Pescado Spring, which is still more important to the Indians than Nutria. I trust hat you will secure an order to be issued to the surveyor-general of New Mexico to so lay off the reservation.

The persons who have taken the preliminary steps to secure the land at Nutria are mostly Army officers, I understand, and one of them assured me to-day that if the land was subject to entry by any one they wanted it, but if it belonged to the Indians, and they, the Indians, were to have it, they would not press their claim as against the Indians, provided the money already paid were refunded to them, and their act would not exhaust their right to enter land.

Very respectfully, your obedient servant,

BEN. M. THOMAS,
United States Indian Agent.

Hon. H. PRICE,
Commissioner, Washington, D. C.

8.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, April 26, 1883.

SIR: I have the honor to inclose herewith a letter from Agent Thomas, of the Pueblo Agency, in New Mexico, dated April 12 (instant), by which it will be seen that a change in the description of the boundary lines of the Zuni Indian Reservation,

in said Territory, is necessary in order to effect the object held in view in the establishment of said reservation, which was "to secure to these Indians (the Zuni Pueblos) an indisputable title to these lands, which will serve as a barrier to any inroads upon their improvements by white settlers." (See office letter of March 13, 1877, copy herewith.)

The recent survey of the public lands in that section has developed the fact that the description given in the Executive order of March 16, 1877, does not cover the settlements and improvements of the Indians at Nutria Springs, as it was expected to do. I have therefore caused to be prepared, and herewith submit, a draft of an Executive order intended to meet the purpose aimed at in the first instance, and have to request that the same be laid before the President for his signature.

The return of Agent Thomas's letter, and the correspondence to which he therein refers, which is also herewith inclosed for your examination, is respectfully requested.

Very respectfully, your obedient servant,

E. L. STEVENS,
Acting Commissioner.

The Hon. the SECRETARY OF THE INTERIOR.

9.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, March 13, 1877.

SIR: I have the honor to invite your attention to the condition of the Pueblo Indians, residing on the Pueblo of Zuni, in New Mexico.

These poor but industrious Indians have a land grant from the Spanish Government of two leagues square, but it is nearly worthless for agricultural or grazing purposes.

Heretofore these Indians have supported themselves by cultivating detached and scattered patches of land along the Zuni River, lying outside the limits of their grant. Now that white settlements are rapidly approaching that locality it is important to secure these Indians an indisputable title to these lands, which will serve as a barrier to any inroads upon their improvements by white settlers.

With this object in view, instructions were issued October 7, 1875, directing the agent for these Indians to report what quantity of land was needed for them and where suitable lands could be obtained, to be accompanied with a plat and topographical description thereof, using the precaution not to include therein any tracts occupied by settlers, or to which the title had passed from the Government.

In compliance therewith, Agent Thomas, under date of the 28th ultimo, submitted a report recommending that the following described tract of land be withdrawn from sale and set apart for the use and occupancy of these Indians, viz: Beginning at the one hundred and thirty-sixth milestone on the western boundary line of the Territory of New Mexico, and running N. 61° 45′ E., 31.80 miles, more or less, to the crest of the mountain a short distance above Nutrias Spring; thence due south 12 miles, more or less, to a point in the hills a short distance southeast of Ojo Pescado; thence S. 61° 45′ W., to the one hundred and forty-eighth milestone on the western boundary line of the Territory of New Mexico; thence north with said boundary line to the place of beginning.

This may seem a large tract of country for the home and stock of 1,500 Indians, but Agent Thomas reports it as very barren, and yet necessary to retain the water privileges surrounding the villages and springs, marked on the accompanying map as "Nutria," "Ojo Pescado," and "Ojo Caliente," and many small patches of land on the river.

Concurring in the suggestions made by Agent Thomas, which have the indorsement of the governor, the secretary, the chief justice, and the surveyor-general of the Territory, I have the honor to recommend that the President be requested to issue an order setting apart this tract of country as an Indian reservation.

A draft of such order, with plat of the land in question, is herewith respectfully submitted.

Very respectfully, your obedient servant,

J. Q. SMITH,
Commissioner.

The Hon. the SECRETARY OF THE INTERIOR.

Explanation.

Points indicated in Executive Order of March 16 - 1877. ○

Points indicated in Executive Order of May 1 - 1883. ○

Boundary as given in Ex. Or. of March 16 - 1877:

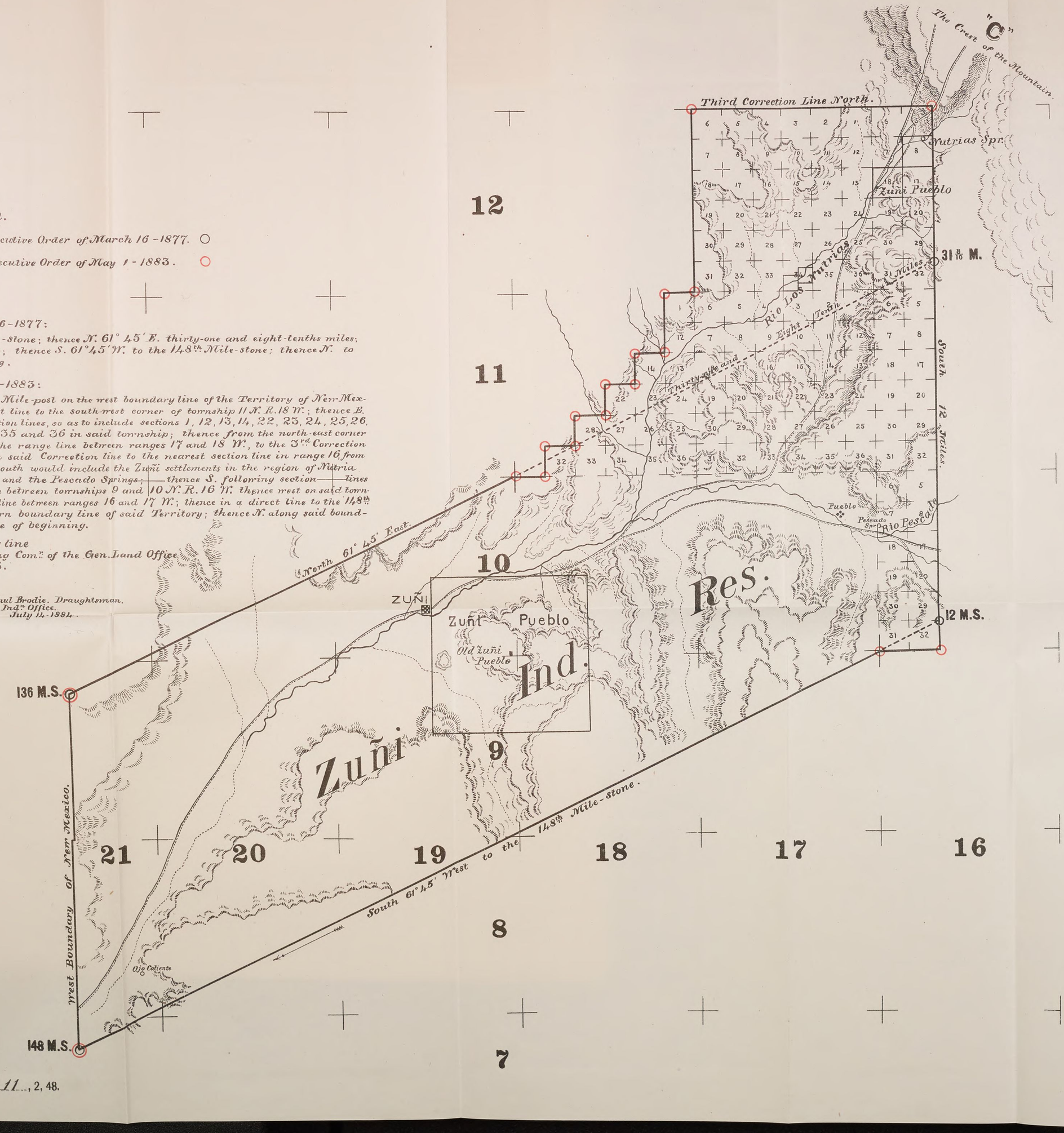
Beginning at 136th Mile-stone; thence N. 61° 45′ E. thirty-one and eight-tenths miles; thence S. twelve miles; thence S. 61° 45′ W. to the 148th Mile-stone; thence N. to the place of beginning.

Boundary as given in Ex. Or. of May 1 - 1883:

Beginning at the 136th Mile-post on the west boundary line of the Territory of New-Mexico; thence in a direct line to the south-west corner of township 11 N. R. 18 W.; thence E. and N., following section lines, so as to include sections 1, 12, 13, 14, 22, 23, 24, 25, 26, 27, 28, 32, 33, 34, 35 and 36 in said township; thence from the north-east corner of said township on the range line between ranges 17 and 18 W., to the 3rd Correction line N., thence E. on said Correction line to the nearest section line in range 16, from whence a line due south would include the Zuñi settlements in the region of Nutria and Nutria Springs and the Pescado Springs; thence S. following section lines to the township line between townships 9 and 10 N. R. 16 W. thence west on said township line to the range line between ranges 16 and 17 W.; thence in a direct line to the 148th Mile-post on the western boundary line of said Territory; thence N. along said boundary line to the place of beginning.

For determination of east boundary line
See letter from the Acting Comr of the Gen. Land Office dated June 2d 1883.

Drawn by Paul Brodie. Draughtsman.
Ind.n Office.
July 14 - 1884.



H. EX. 11, 2, 48.

10.

DEPARTMENT OF THE INTERIOR,
Washington, April 28, 1883.

SIR: I have the honor to submit herewith a letter from the Commissioner of Indian Affairs of the 26th instant, reporting that it has been found that the distances, &c., defining the out-boundaries of the Zuni Pueblo Reservation as stated in Executive order of March 16, 1877, are not sufficiently accurate to include within said reservation all of the lands specified in said order, and submitting the draft of an Executive order to amend the order of March 16, 1877, so as more accurately to describe and define the boundaries of said reservation.

Concurring in the recommendation of the Commissioner of Indian Affairs, I have the honor to request that the draft of order may receive your signature.

Very respectfully, your obedient servant,

H. M. TELLER,
Secretary.

The PRESIDENT.

11.

DEPARTMENT OF THE INTERIOR,
Washington, May 2, 1883.

SIR: I transmit herewith an Executive order of the 1st instant, issued by the President in lieu of Executive order of March 16, 1877, making certain change in description of Zuni Indian Reservation boundaries in New Mexico, as recommended in your communication of the 26th ultimo, and you will please furnish a copy of the inclosed order for the information of the General Land Office.

Other papers are also returned herewith.

Very respectfully,

H. M. TELLER,
Secretary.

The COMMISSIONER OF INDIAN AFFAIRS.

12.

EXECUTIVE MANSION,
May 1, 1883.

Whereas it is found that certain descriptions as to boundaries given in Executive order issued March 16, 1877, setting apart a reservation in the Territory of New Mexico for the Zuni Pueblo Indians, are not stated with sufficient definiteness to include within said reservation all the land specified in and intended to be covered by said Executive order, especially the Nutria Springs and Ojo Pescado, said Executive order is hereby so amended that the description of the tract of land thereby set apart for the purposes therein named shall read as follows:

Beginning at the one hundred and thirty-sixth mile-post on the west boundary line of the Territory of New Mexico, thence in a direct line to the southwest corner of T. 11 N., R. 18 W.; thence east and north, following section lines so as to include secs. 1, 12, 13, 14, 22, 23, 24, 25, 26, 27, 28, 32, 33, 34, 35, and 36, in said township; thence from the northeast corner of said township on the range-line between R. 17 and 18 W., to the third correction line north; thence east on said correction line to the nearest section line in R. 16, from whence a line due south would include the Zuni settlements in the region of Nutria and Nutria Springs and the Pescado Springs; thence south, following section lines to the township line between T. 9 and 10 N., R. 16 W.; thence west on said township line to the range line between R. 16 and 17 W.; thence in a direct line to the one hundred and forty-eighth mile-post on the western boundary line of said Territory; thence north along said boundary line to place of beginning.

CHESTER A. ARTHUR.

13.

PAY DEPARTMENT UNITED STATES ARMY,
Santa Fé, N. Mex., May 3, 1883.

DEAR SIR: The inclosed copy of an order from the Commissioner of General Land Office to the surveyor-general of New Mexico indicates that there is some disposition to interfere and change the location of the Zuni Reservation surveyed under an Executive order of President Hayes.

I desire to call your attention to the fact that lands in T. 12 N., R. 16 W., and 12 N., R. 17 W., from headwaters of the Nutria, in sec. 8, T. 12 N., R. 16 W., following the course of the Nutria to the Zuni Reservation line to the southwest in T. 12 N., R. 17 W., were located by myself and associates and the laws complied with, the money paid, with the usual certificates of location in our possession, the land at the time being Government land, as shown by the Land Department maps, and subject to such locations and entry. This land was entered in good faith, known not to be on the Zuni Reservation by all the officers of the Land Department, and also known to the agent for the Pueblo Indians. In the name and for those having made said locations and entries, I respectfully protest against any action that would be calculated to interfere with our said rights acquired under the law. Soon after these entries were made, an officious person who thinks he has the Indian interests at heart commenced making a disturbance in reference to these entries, and procured an attack to be made upon Senator Logan, charging him with having, in violation of law, entered this property, when in fact he had not done so, but had stated to myself and others that the land was subject to location and entry.

I desire to call your attention to the following propositions:

(1.) The Zuni Indians as well as all the other Pueblo Indians of New Mexico were citizens of Mexico capable of holding land in their own right, the Zunis having a grant of land from the Mexican Government, which was confirmed to them by the United States Government. Under the treaty with Mexico they are citizens of the United States, and have been so held by the courts. This being the case the right of President Hayes to give to them the land of the Government by an Executive order is a question that might well be considered.

(2.) Their grant as well as the land claimed to be set apart for them by President Hayes is well watered, the Nutria River, formed by different springs, running entirely through the land given to them by President Hayes's order; also, the Rio Piscado running entirely through the Zuni Valley and through their grant. To now extend by Executive order the reservation set aside by the "Hayes order," so as to compel a survey on a straight line, or any other line, to include the Nutria Spring within their reservation, would take every drop of water in the two valleys, totally depriving every other section of Government land in that locality from any water whatever, rendering a large body of land entirely useless, and depriving the Government from any disposition of the same.

These entries in nowise affect the interests of the Indians, and we cannot see why the rights of other people should be disturbed merely to satisfy the wailings of some disappointed persons who did not get the land themselves, and now wish to put the Indians forward to do an injury to others merely to gratify their own vindictive feelings.

I am, sir, very respectfully, your obedient servant,

W. F. TUCKER, JR.,
U. S. A.

Hon. H. M. TELLER,
Secretary Interior Department, Washington, D. C.

14.

[Inclosure.]

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., April 28, 1883.

SIR: I have received your letter, dated the 21st instant, stating that Deputy Armstrong is ready to return to the field and correct his survey of T. 12 N., R. 16 W., and T. 11 and 12 N., R. 17 W., of New Mexico principal meridian, by establishing the Zuni Indian Reservation boundary and closing the lines of public surveys thereon, and you request instructions in the matter.

In reply, I have to state that the agent for said Indians has reported that the boundary lines of said reservation as defined by the Executive order dated March 16, 1877, if established in the field according to the course and distance mentioned, will not include the Nutrias and Ojo Pescado Springs, also mentioned in said order, and certain Indian settlements in the neighborhood of said springs, and I learn informally that a new Executive order is being prepared, correcting the description of said boundaries, and where the lands have been subdivided taking certain legal subdivision lines for the Indian boundary.

In case a new order shall be made you will be furnished with a copy of it, and you will be further advised as to what is necessary in regard to surveying the reservation boundaries.

You will therefore suspend any further survey of the boundary until further orders.

Very respectfully,

N. C. McFARLAND,
Commissioner.

HENRY M. ATKINSON, Esq.,
United States Surveyor-General, Santa Fé, N. Mex.

15.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, May 5, 1883.

SIR: I inclose herewith, for your information, a copy of an Executive order, dated May 1, 1883, declaring with greater definiteness the boundaries of the reservation in New Mexico, set apart by Executive order of March 16, 1877, for the Zuni Pueblo Indians.

Very respectfully,

H. PRICE,
Commissioner.

The COMMISSIONER OF THE GENERAL LAND OFFICE.

16.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, May 5, 1883.

SIR: Referring to letter of your predecessor of the 12th ultimo, in the matter of the Zuni Indian Reservation boundaries, in New Mexico, I inclose herewith, for your information, a copy of an Executive order, dated May 1, 1883, declaring said boundaries as described in Executive order of March 16, 1877, with greater definiteness.

Very respectfully,

H. PRICE,
Commissioner.

PEDRO SANCHEZ, Esq.,
United States Indian Agent, Pueblo Agency, New Mexico.

17.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., May 9, 1883.

SIR: I have to acknowledge the receipt of your letter, dated the 5th instant, inclosing copy of Executive order, dated May 1, 1883, declaring the Zuni Indian Reservation boundaries somewhat modified from those contained in the original order establishing the reservation.

The necessary instructions to the United States surveyor-general and register and receiver have been this day issued for the protection of the reservation.

Very respectfully,

N. C. McFARLAND,
Commissioner.

Hon. H. PRICE,
Commissioner of Indian Affairs.

18.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., June 2, 1883.

SIR: Referring to the Executive order, dated the 1st of May, 1883, modifying the boundaries of the Zuni Indian Reservation in New Mexico, I have to inform you that I have received from the United States surveyor-general for that Territory information that, according to the best data obtainable as to the location of the Nutrias and Pescado Springs, the eastern line of said reservation will now run so as to include the two western tiers of sections in T. 10, 11, and 12 N., R. 16 W., of New Mexico meridian.

Inclosed herewith is a rough diagram showing what sections and townships of surveyed land are now within the reservation.

Very respectfully,

L. HARRISON,
Acting Commissioner.

Hon. H. PRICE,
Commissioner of Indian Affairs, Washington, D. C.

19.

243 STATE STREET,
Chicago, July 12, 1883.

DEAR SIR: Remembering that when I was suffering a wrong from the appraiser's department of New York custom-house, I was righted in great measure through your kind consideration, I make bold to address you personally in reference to an attempted wrong, which I believe to be directly in your power to prevent. I refer to the attempt of Senator Logan and his friends to obtain certain lands belonging to the Zunis.

The most essential facts in connection with a popular statement of the law which I think governs the case are contained in the inclosed article, which I beg that you will kindly read.

I have no doubt whatever that the law properly invoked would maintain the rights of these poor townspeople aborigines without your executive interference, but they are poor and helpless, having neither the means nor the knowledge which are necessary for their legal protection against the tricks of a land sharper, and especially one of Senator Logan's position and ability.

Upon you, therefore, their rights depend, and I would not have the slightest fear of the result did I not know that the press of business often causes important matters to be necessarily neglected, if there is no one to direct and urge special attention to them.

I have no interest but the desire to prevent robbery and outrage. I am and always have been a Republican, and I never came in contact with Senator Logan, or had any reason to oppose him or his projects in any shape till my investigation of this matter.

I remain, yours, very truly,

EDWIN A. CURLY.

His Excellency CHESTER A. ARTHUR,
President of the United States.

[The inclosure referred to in the above letter is a newspaper slip from the American Field of July 14, 1883. (Unofficial.)]

20.

243 STATE STREET, *Chicago, Ill.*

DEAR SIR: Herewith please find an article from the American Field written by myself as a result of a personal investigation of Senator Logan's Zuni land grab.

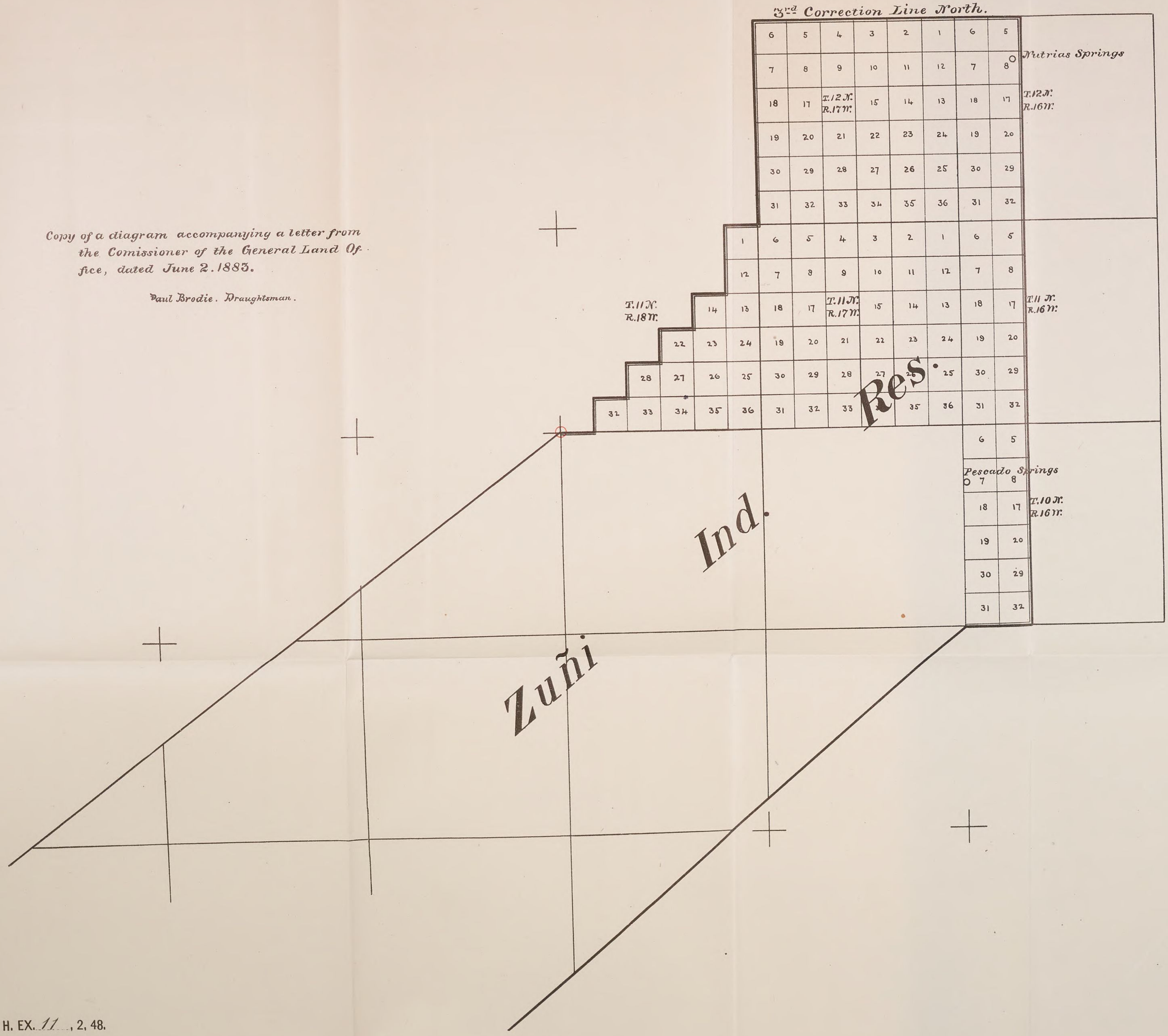
I am confident that my facts will bear thorough investigation, and also that the points of law which I have raised will commend themselves to your good judgment as a lawyer.

I am a Republican and I have no personal, pecuniary, or factional interest in the matter, but in a case of peculiar hardship coming within my own observation, I make bold to interfere even against Senator Logan that justice may be done.

I need scarcely remind you that whatever the rights of these poor towns-people, they have no means of enforcing them, and it must be your Department and the Ex

Copy of a diagram accompanying a letter from the Comissioner of the General Land Office, dated June 2. 1883.

Paul Brodie. Draughtsman.



H. EX. 11, 2, 48.

ecutive power alone that protects them from this gross injustice, if they are protected at all.

I say confidently in addition that the general public opinion of New Mexico is in this case three to one in favor of justice, and all through the neighborhood of the Zunis where the particulars are best known it is practically unanimous—a good augury, as I hope, of the sentiments of the country at large.

I remain yours very truly,

EDWIN A. CURLY,
Travel Editor.

Hon. H. M. TELLER,
Secretary of the Interior.

[The inclosure referred to in the above letter is a newspaper slip from the American Field of July 14, 1883. (Unofficial.)]

21.

WASHINGTON, D. C., *April* —, 1884.

SIR: I have the honor to acknowledge the receipt of your letter of February 1, 1884, containing instructions as follows:

"Col. JAMES STEVENSON,
"*Geological Survey:*

"SIR: By order of May, 1883, the lines of the Zuni Reservation in the Territory of New Mexico were extended so as to include the Nutrias Springs and the Ojo Pescado as well as other lands therein set forth. This order was issued upon the representation that unless these springs were included within the reservation the Indians would be deprived of the requisite supply of water for farming purposes. Understanding that you are familiar with the history and wants of the Zuni tribe, as well as the questions affecting the boundary of their reservation which have arisen under the Executive order above mentioned, you are directed to make a full report to this Department on the subject at your earliest convenience."

In compliance therewith, I have the honor to submit the following report:

The pueblo of Zuni is situated near the northwestern border of New Mexico. The original Spanish grant to the Zuni Pueblo Indians by Don Domingo Jronza, Petroz de Cruzate, was made September 25, 1689, and extended one league east, west, north, and south, measured from the four corners of the pueblo, which at that time was either located upon the summit of Thunder Butte or immediately at its base, about two and a half miles from the present site of the pueblo. I am not aware whether this grant was ever confirmed to the tribe by the United States or not. But be this as it may, its entire area, as shown on the accompanying sketch-chart, is included in the reservation by order of March 16, 1877.

The present site of Zuni, as shown by the sketch, is located just outside the western boundary of said grant. In 1877 the following Executive order was issued for the purpose of meeting the wants of the Zuni tribe:

"EXECUTIVE MANSION, *March* 16, 1877.

"It is hereby ordered that the following-described tract of country in the Territory of New Mexico, viz: Beginning at the one hundred and thirty-sixth mile-stone on the western boundary line of the Territory of New Mexico, and running thence north 61° 45′ east, 31 miles and eight-tenths of a mile to the crest of the mountain a short distance above Los Nutrias Springs; thence due south 12 miles to a point in the hills a short distance southeast of the Ojo Pescado; thence south 61° 45′ west of the 148th mile-stone on the western boundary line of said Territory; thence north with said boundary line to the place of beginning, be, and the same hereby is, withdrawn from sale and set apart as a reservation for the use and occupancy of the Zuni Pueblo Indians.

"R. B. HAYES."

In the month of December, 1882, and January, 1883, Messrs. Lawton, Tucker, and Stout, residing in New Mexico, entered, under the desert-land act, Secs. 8 and 18 in T. 12 N., R. 16 W., of the New Mexico principal meridian, and Sec. 24 and one-half of Sec. 34 in the same township, R. 17.

On May 1, 1883, the following Executive order was issued for the purpose of including lands said to have been omitted by Executive order of March 16, 1877:

"EXECUTIVE MANSION, *May* 1, 1883.

"Whereas it is found that certain descriptions as to boundaries given in an Executive order issued March 16, 1877, setting apart a reservation in the Territory of New

Mexico for the Zuni Pueblo Indians, are not stated with sufficient definiteness to include within said reservation all the lands specified in, and intended to be covered by, said Executive order, especially the Nutrias Springs and the Ojo Pescado, said Executive order is hereby so amended that the description of the tract of land thereby set apart for the purposes herein named shall read as follows: Beginning at the one hundred and thirty-sixth mile-post on the west boundary line of the Territory of New Mexico; thence in a direct line to the southeast corner of T. 11 N., 18 W.; thence east and north following section lines so as to include Secs. 1, 12, 13, 14, 22, 23, 24, 25, 26, 27, 28, 32, 33, 34, 35, 36, in said township; thence from the northeast corner of said township on range line between R. 17 and 18 W. and the third correction line north; thence east on said correction line to the northeast section line in range 16, from whence a line due south would include the Zuni settlements in the region of Nutrias and Nutrias Springs and the Pescado Springs; thence south following section lines to the township lines between T. 9 and 10 N., R. 16 W.; thence west on said township line to the range line between R. 16 and 17 W.; thence in a direct line to the one hundred and forty-eighth mile-post on the western boundary line of said Territory; thence north along said boundary line to the place of beginning.

"CHESTER A. ARTHUR."

By comparing the accompanying chart, which shows the lines of the survey made in accordance with Executive order of March 16, 1877, with the text of that order, it will be seen that in one particular they do not agree. According to the words of the order the survey was to begin "at the one hundred and thirty-sixth mile-stone on the western boundary line of the Territory of New Mexico," and to run "thence north 61° 45′ east 31.8 *miles to the crest of the mountain a short distance above the Nutrias Springs.*" As shown on the chart the northwest line of the survey does begin at the one hundred and thirty-sixth mile-stone on the boundary line of New Mexico; it does run thence north 61° 45′ east 31.8 miles, but this does not reach the crest of the mountain, nor can the termination be construed as being in any sense a short distance above Nutrias Springs.

As the surveyor found it impossible to fulfill all the requirements of the order, the question arises whether he has been guided by those parts of the directions which should take precedence.

This is a legal question which I must respectfully leave you to decide. I may add that, in my judgment, the surveyor followed the only proper course left him; that is, the directions which were clear and specific rather than the portion which is indefinite. That is to say, he started at the point specified, and ran the course and distance specified, although this did not reach the crest of the mountain above Nutrias Springs.

This left all of T. 12 N., 17 W., and all of Secs. 5, 6, 7, 8, 17, 18, 19, 20, 29 and 30 of T. 12 N., 16 W., outside of the reservation.

You will also see by examining the chart that continuing the line in the same direction to the crest of the mountain at C would not have changed the result in this respect, as the lands I have just mentioned would still have been left out.

In the second place the distance specified, even though the course had been changed, would not reach the mountain crest at any point from which a line running south would include the Ojo Pescado as required by the order. It was, therefore, impossible for the surveyor to comply with that part of the order which required him to run "to the crest of the mountain a short distance above the Nutrias Springs," without changing both direction and distance. And even had this been done so as to comply as nearly as possible with the spirit of the whole order, the line would still have run a little south of the Rio Los Nutrias and would not have included Secs. 8, 18, 24, or 34 of T. 12 N., 17 W., in the reservation.

I may add, further, that the expression "above Nutrias Springs" is so indefinite when applied to this region as really to be without meaning. "Above" may signify farther up the stream, or higher, overlooking. Hence I have not considered this part of the order.

I would state in this connection that the Zunis number about 1,600 persons and are wholly dependent for their sustenance upon pastoral and agricultural pursuits.

In their agricultural industries not more than 10 or 15 per cent. of farming products are derived from irrigation. In the summer season they resort to various localities from 5 to 25 miles from their principal village and select sand areas, sides of hills, mesas, and cañons for planting crops. In their planting they dig down into the earth a sufficient depth to obtain moisture. Their orchards are almost invariably quite high up on the sides of mesas and cañons, where, in a peculiar manner, moisture seems to accumulate.

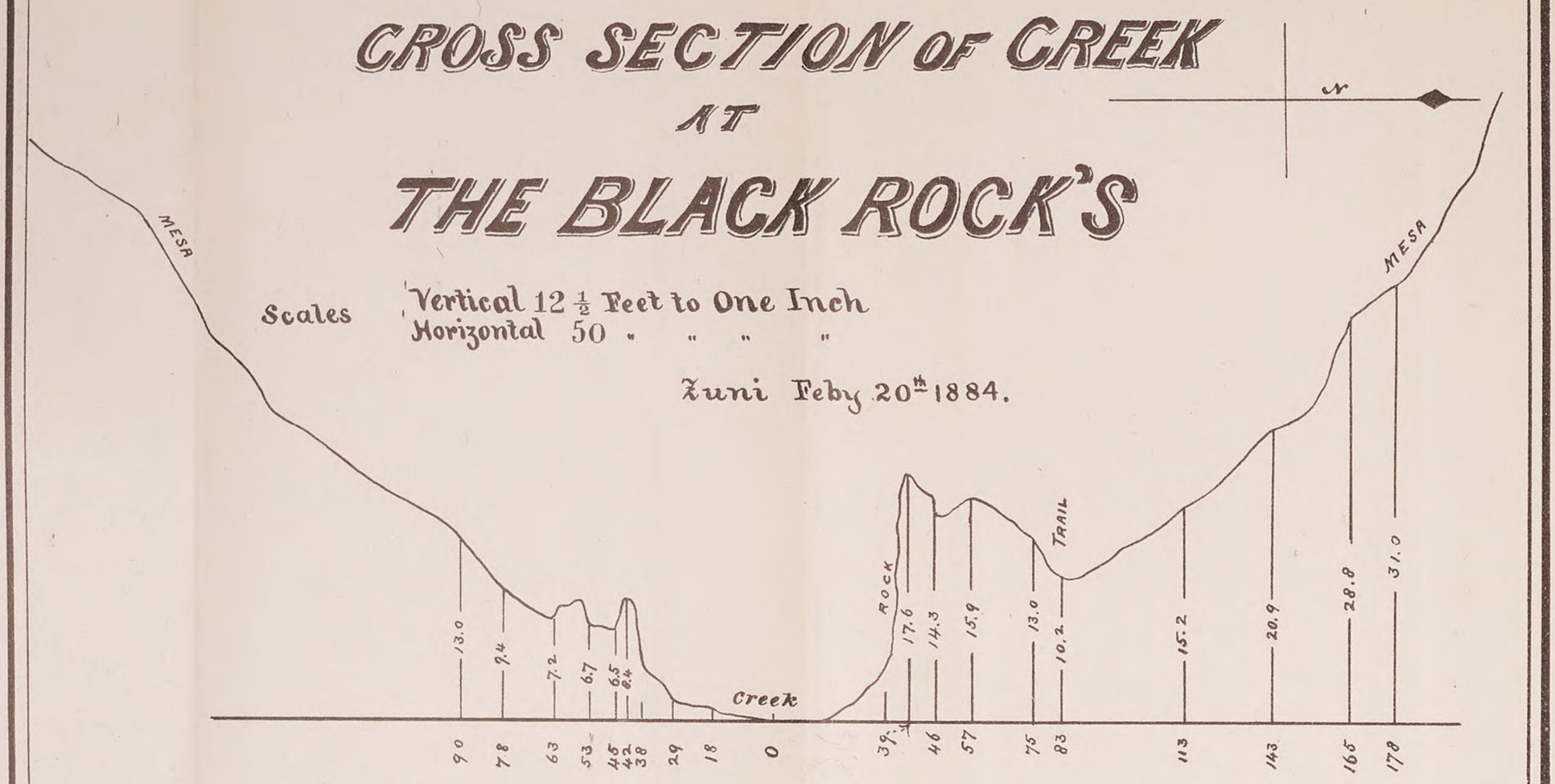
The agricultural industries of the seven Moki villages are carried on in the same manner.

In order to avoid further conflicts between the Zunis and the white settlers, and which would enable the Department to revoke the order under which recent disputes have arisen, I would recommend that a sum of $10,000, or so much thereof as may be

CROSS SECTION OF CREEK
AT
THE BLACK ROCK'S

Scales Vertical 12 ½ Feet to One Inch
Horizontal 50 " " " "

Zuni Feby 20th 1884.

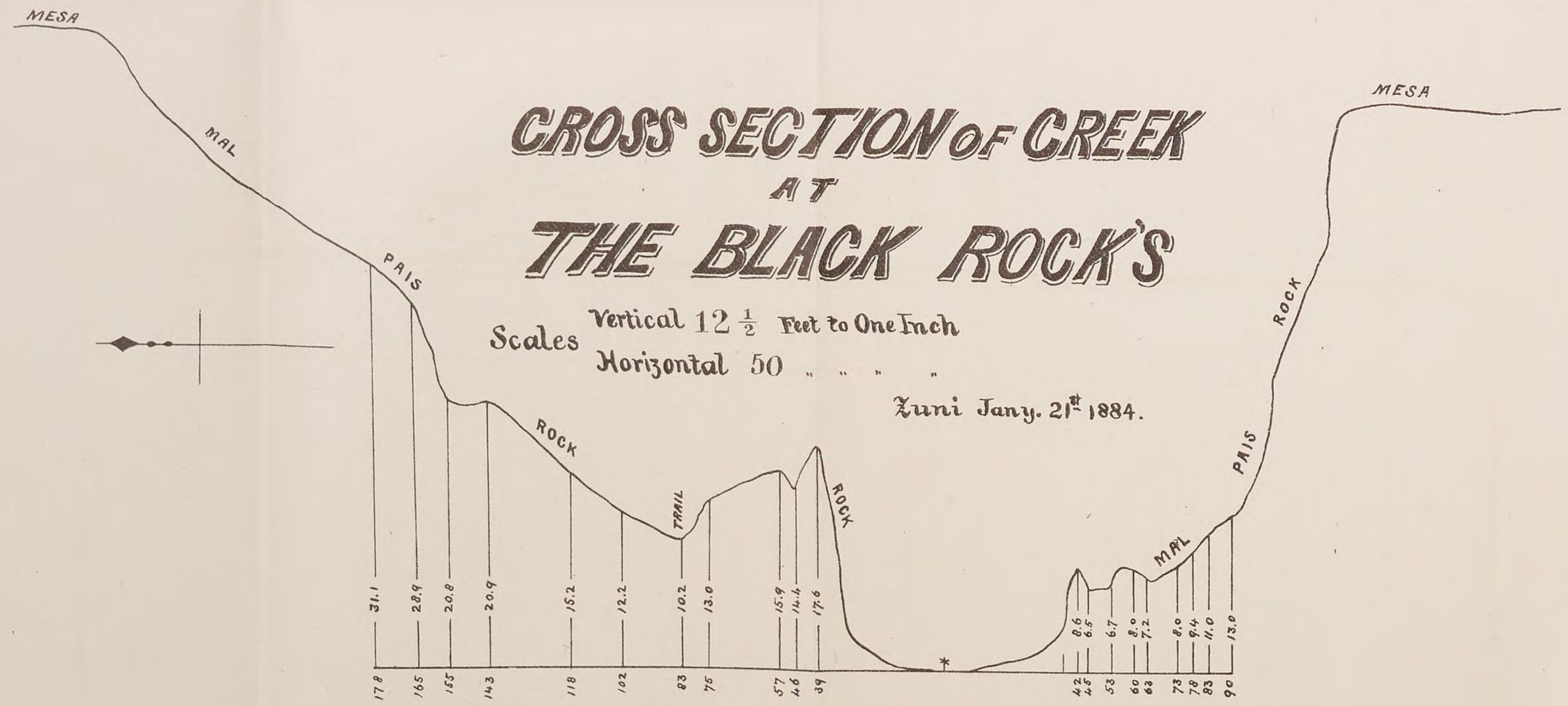


Copied in the Office of Indian Affairs.
July 9-1884.
Paul Brodie. Draughtsman

CROSS SECTION OF CREEK
AT
THE BLACK ROCK'S

Scales Vertical 12 ½ Feet to One Inch
Horizontal 50 " " " "

Zuni Jany. 21st 1884.



Copied in the Office of Indian Affairs
July 9-1884.
Paul Brodie. Draughtsman.

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necessary, be appropriated for the erection of a dam a few miles above the village of Zuni, where the Rio Zuni emerges from the lava beds, and the constructing of irrigating ditches on each side of the river for a distance of from 10 to 12 miles. These ditches, according to an estimate made by Mr. D. D. Graham, an engineer residing among the Zunis, would irrigate about 3,000 acres on each side of the creek.

I inclose small diagrams showing the place for dam and ditches; also the letters from Mr. Graham on the subject.

These ditches would drive a supply of water from the entire sources of the Rio Nutrias and Rio Pescado, which would be ample to irrigate from three to five thousand acres in the immediate valley of the Rio Zuni in the vicinity of the principal Zuni village.

The area of land through which the Rio Nutrias flows, and which, according to the survey is not within the reservation, is not large enough, and could not be occupied in any manner as to deprive those below that point from any perceptible amount of water.

The construction of the ditches and dam referred to would enable the Zunis to occupy and cultivate the lands near their permanent home, while present circumstances compel them to resort to distant localities, from which they only obtain a meager supply of either moisture or water.

Very respectfully, your obedient servant,

JAMES STEVENSON.

The Hon. the SECRETARY OF THE INTERIOR.

22.

[First inclosure.]

ZUNI PUEBLO, N. MEX., *January* 22, 1884.

DEAR SIR: Your favor of January 8 received.

Yesterday I made a survey of the creek at the Black Rocks, and also plan showing cross-section of creek for a proposed dam, which I send you by this mail.

I think a good substantial dam can be built with the material which is there—mal pais rock; it will need to be laid with some care, but it will be cheaper than timber or crib-work. In the plan on the north side you will notice it is a natural dam, and would only require little work; that is, if the dam is built higher than the first point of rock shown on section north side.

It would require two or three days' surveying with such assistance as I have (Indians) to tell exactly how high it would be necessary to build the dam in order to see what ground the water would overflow. I think a dam 25 to 30 feet high would do, and would cost about $2,000 at the most.

The ditch, which I judge will be about 12 miles long, say 4 feet wide on bottom and 2 feet deep, would cost about $400 a mile, and would irrigate 10,000; to 12,000 acres; that is, if the inclination, 2½ feet to the mile, would carry the water round by the foot of Thunder Mountain and the other hills south of the Pueblo of which you are acquainted with.

In regard to the cultivated land which the Indians cultivated last year, In am sorry to have inform you that I have been unable to get any information, and as to give you an approximate estimate would be giving you information of which I have no knowledge whatever, so I will have to leave it to you for to estimate.

I wanted each Indian to go out to his field, and step off the field, length and breadth; by that means I could have sent you a close estimate. I told them what it was for; that it was necessary to know before building the ditch. Their fields are scattered here and there, wherever there is an arroyer and the ground moist, such as Pescado, Nutrias, Ojo Caliente.

The mail will leave in the morning, and I am sorry to send this letter without the information.

Thanking you for your attention, I remain,

Yours, very respectfully,

D. D. GRAHAM.

Col. JAMES STEVENSON,
Washington, D. C.

23.

[Second inclosure.]

ZUNI PUEBLO, *February* 21, 1884.

MY DEAR COLONEL: Your letter of February 1 reached me a few days ago. Inclosed please find duplicate of cross-section of creek at the Black Rocks.

Since I sent you the first plan I have taken levels to see how high a dam ought to be. I find it will take a dam 30 feet high to flood the meadow; the water will back up to the mouth of the cañon, which is about 2½ miles from the Black Rocks. It would be a large lake, and afford enough water to irrigate the Zuni Valley of about 3,000 acres on each side of the creek.

Yours, truly,

D. D. GRAHAM.

Col. JAMES STEVENSON,
Washington, D. C.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., November 22, 1884.

SIR: I am in receipt, by reference from you for report, of the resolution of the House of Representatives of June 24, 1884, requesting copies of all reports, correspondence, and other papers on file in the Interior Department relating to the alleged claims of any persons to a portion of the lands in the Zuni Indian Reservation, and also what action the Department has taken in the premises.

I have the honor to report that, on December 7, 1882, in reply to a letter from the local land officers at Santa Fé, N. Mex., they were advised that, as near as could be ascertained from the records of this office, it would appear that T. 12 N., of R. 16 W., was outside of said reservation, and of T. 12 N., R. 17 W., probably only Secs. 25, 26, 33, and 36 was within the reservation, but that, upon the survey of said reservation, if it should be found to embrace more of the land than that mentioned, any entries found to have been made within the reservation would be suspended.

Subsequently, on December 26, 1882, and on January 18 and 27, 1883, two homestead and three desert-land entries were allowed by the local officers upon lands embraced in the reservation, as amended by Executive Order of May 1, 1883. Said entries remain suspended on the files and records of this office.

I inclose herewith copies of the entries referred to, together with copies of all letters and papers on file and on record in this office relating to said reservation chronologically arranged. The resolution is herewith returned.

Very respectfully,

N. C. MCFARLAND,
Commissioner.

Hon. H. M. TELLER,
Secretary of the Interior.

EXECUTIVE MANSION, *March* 16, 1877.

It is hereby ordered, that the following described tract of country in the Territory of New Mexico, viz: Beginning at the one hundred and thirty-sixth mile-stone on the western boundary line of the Territory of New Mexico, and running thence north 61° 45′ east thirty-one miles and eight-tenths of a mile to the west of the mountain a short distance above Nutrias Springs; thence due south twelve miles to a point in the hills a short distance southeast of the Ojo Pescado; thence south 61° 45′ west to the one hundred and forty-eighth mile-stone on the western boundary line of said Territory; thence north with said boundary line to the place of beginning, be, and the same hereby is, withdrawn from sale, and set apart as a reservation for the use and occupancy of the Zuni Pueblo Indians.

R. B. HAYES.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., March 29, 1877.

SIR: I inclose herewith, for the files of your office, copy of the President's order, dated March 16, 1877, setting apart certain lands in the Territory of New Mexico for the use and occupancy of the Zuni Pueblo Indians.

You will lay down said reservation upon the official diagram of your district, and cause the same to be respected in the future extension of the public lines.

Very respectfully,

J. A. WILLIAMSON,
Commissioner.

H. M. ATKINSON, Esq.,
Surveyor-General, Santa Fé, N. Mex.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., December 7, 1882.

GENTLEMEN: I am in receipt of your letter of November 23, 1882, asking whether T. 12 N., R. 16 and 17 W., are within the reservation for the Zuni Indians, as the same are unsurveyed, and you have several applications for desert-land entries in said townships.

In reply you are informed that as near as can be ascertained from our records T. 12 N., R. 16 W., is outside, while of T. 12 N., R. 17 W., probably only Secs. 25, 26, 33, and 36 are within the reservation.

When said townships are surveyed the reservation may be found to embrace more of the land than that mentioned, and if any desert-land entries are found to have been located within the reservation, they will be held for cancellation.

Very respectfully,
N. C. McFARLAND,
Commissioner.

REGISTER and RECEIVER,
Santa Fé, N. Mex.

No. 53.] UNITED STATES LAND OFFICE,
Santa Fé, N. Mex., December 26, 1882.

It is hereby certified that under the provisions of the act of Congress approved March 3, 1877, entitled "An act to provide for the sale of desert lands in certain States and Territories," Orrin B. Stout has this day filed in this office his declaration of intention to reclaim the following-described tract of land, viz: The whole of Sec. No. 18, T. 12 N., R. 16 W.; that he has proven to our satisfation that the said tract of land is desert land as defined in the second section of said act, and that he has paid to the receiver the sum of $160, being at the rate of 25 cents per acre for the land above described.

It is, therefore, further certified that if within three years from the date hereof the said Orrin B. Stout, his heirs or legal representatives, shall satisfactorily prove that the said land has been reclaimed by carrying water thereon, and shall pay to the receiver the additional sum of one dollar per acre for the land above described, he or they shall be entitled to receive a patent therefor under the provisions of the said act.

MAX FROST, *Register.*
W. H. BAILHACHE, *Receiver.*

NOTE.—The word "heirs" is substituted in this form for the word "assignee," the Secretary of the Interior having declined to recognize the assignment of desert land claims.

[Desert land act of March 3, 1877.]

AFFIDAVIT.

No. 53.] LAND OFFICE AT SANTA FÉ, N. MEX.,
November 22, 1882.

I, William F. Tucker, jr., of the United States Army, county ———, being duly sworn, declare upon oath: That I am a resident of said Territory; that I am of the age of twenty-one years, and by occupation a paymaster; that I am well acquainted with the character of each and every legal subdivision of the following described land: Sec. 18, T. 12 N., R. 16 W., containing ——— acres; that I became acquainted with said land by observation and inspection; that I have been acquainted with it for one year last past; that I have frequently passed over it; that my knowledge of said land is such as to enable me to testify understandingly concerning it; that the same is desert land within the meaning of the second section of the act of Congress approved March 3, 1877, entitled "An act to provide for the sale of desert lands in certain States and Territories;" that said land will not, without artificial irrigation, produce any agricultural crop; that no agricultural crop has ever been raised or cultivated on said land for the reason that it does not contain sufficient moisture for successful cultivation; that the same is essentially dry and arid land, wholly unfit for cultivation without artificial irrigation; that said land cannot be successfully cultivated without reclamation by conducting water thereon; that said land has hitherto been unappropriated, unoccupied, and unsettled, because it has been impossible to cultivate it successfully on account of its dry and arid condition; that it is a fact well known, patent, and notorious, that the same will not, in its natural condi-

tion, produce any crop; that the land is the desert land; that there is no timber growing thereon, but that it is devoid of timber; that there is not, to my knowledge, within the limits thereof, any vein or lode of quartz, or other rock in place, bearing gold, silver, cinnabar, lead, tin, or copper, or any deposit of coal; that there is not, within the limits of said land, to my knowledge, any placer, cement, gravel, or other valuable mineral deposit or salines; that no portion of said land is claimed for mining purposes under the local customs or rules of miners or otherwise; that no portion of said land is worked for mineral during any part of the year by any person or persons; that said land is essentially non-mineral land; that I am not interested in any way or manner, directly or indirectly, present or prospective, in any application or declaration made or to be made for said land, or in the land itself, or in the title which may by any person or in any manner be acquired thereto.

WILLIAM F. TUCKER, JR.

LAND OFFICE AT SANTA FÉ, N. MEX.,
November 22, 1882.

I hereby certify that the above affidavit was taken and subscribed before me this day, and that William F. Tucker, jr., whose name is affixed thereto, is a person of respectability, to whose testimony full credence should be given.

MAX FROST, *Register*.
W. H. BAILHACHE, *Receiver*.

[Desert land act of March 3, 1877.]

AFFIDAVIT.

No. 53.] LAND OFFICE AT SANTA FÉ, N. MEX.,
November 22, 1882.

I, Henry W. Lawton, of Santa Fé County, Territory of New Mexico, being duly sworn, declare upon oath: That I am a resident of said county and Territory; that I am of the age of ———, and by occupation an army officer; that I am well acquainted with the character of each and every legal subdivision of the following-described land: Sec. 26, T. 12 N., R. 17 W., containing 640 acres; that I became acquainted with said land by personal observation; that I have been acquainted with it for one year last past; that I have frequently passed over it; that my knowledge of said land is such as to enable me to testify understandingly concerning it; that the same is desert land within the meaning of the second section of the act of Congress approved March 3, 1877, entitled "An act to provide for the sale of desert lands in certain States and Territories;" that said land will not, without artificial irrigation, produce any agricultural crop; that no agricultural crop has ever been raised or cultivated on said land for the reason that it does not contain sufficient moisture for successful cultivation; that the same is essentially dry and arid land, wholly unfit for cultivation without artificial irrigation; that said land cannot be successfully cultivated without reclamation by conducting water thereon; that said land has hitherto been unappropriated, unoccupied, and unsettled, because it has been impossible to cultivate it successfully on account of its dry and arid condition; that it is a fact well known, patent, and notorious, that the same will not, in its natural condition, produce any crop; that the land is the tract is the identical part of land described and desert land; that there is no timber growing thereon, but that it is devoid of timber; that there is not, to my knowledge, within the limits thereof, any vein or lode of quartz, or other rock in place, bearing gold, silver, cinnabar, lead, tin, or copper, or any deposit of coal; that there is not, within the limits of said land, to my knowledge, any placer, cement, gravel, or other valuable mineral deposit or salines; that no portion of said land is claimed for mining purposes under the local customs or rules of miners or otherwise; that no portion of said land is worked for mineral during any part of the year by any person or persons; that said land is essentially non-mineral land; that I am not interested in any way or manner, directly or indirectly, present or prospective, in any application or declaration made or to be made for said land, or in the land itself, or in the title which may by any person or in any manner be acquired thereto.

H. W. LAWTON.

LAND OFFICE AT SANTA FÉ, N. MEX.,
November 22, 1882.

I hereby certify that the above affidavit was taken and subscribed before me this day, and that Henry W. Lawton, whose name is affixed thereto, is a person of respectability, to whose testimony full credence should be given.

MAX FROST. *Register*.
W. H. BAILHACHE, *Receiver*.

[Desert land act of March 3, 1877.]

DECLARATION.

No. 53.] LAND OFFICE AT SANTA FÉ, N. MEX.,
November 22, 1882.

I, Orrin B. Stout, of Santa Fé County, Territory of New Mexico, being duly sworn, depose and declare: That I am a citizen of the United States, of the age of twenty-one years, and a resident of said county and Territory, and by occupation a clerk; that I intend to reclaim a tract of desert land, not exceeding one section, by conducting water upon the same, within three years from date, under the provisions of the act of Congress approved March 3, 1877, entitled "An act to provide for the sale of desert lands in certain States and Territories." The desert land which I intend to reclaim does not exceed one section, and is situated in Valencia County, in the Santa Fé land district, and is described as follows, to wit: the whole of Sec. 18, T. 12 N., R. 16 W., containing 640 acres. I further depose, that I have made no other delaration for desert lands under the provisions of said act; that the land above described will not, without irrigation, produce an agricultural crop; that there is no timber growing upon said land; that there is not, to my knowledge, within the limits thereof, any vein or lode of quartz, or other rock in place, bearing gold, silver, cinnabar, lead, tin, or copper, or any deposit of coal; that there is not within the limits of said land, to my knowledge, any placer, cement, gravel, or other valuable mineral deposit or salines; that no portion of said land is claimed for mining purposes, under the local customs or rules of miners or otherwise; that no portion of said land is worked for mineral during any part of the year by any person or persons; that said land is essentially non-mineral land; that I became acquainted with said land by personal observation, and that my declaration therefor is not made for the purpose of fraudulently obtaining title to mineral land, timber land, or agricultural land, but for the purpose of faithfully reclaiming, within three years from the date hereof, by conducting water thereon, a tract of land which is desert land within the meaning of the act.

ORRIN B. STOUT.

LAND OFFICE AT SANTA FÉ, N. MEX.,
November 22, 1882.

I hereby certify that the foregoing declaration was this day sworn to and subscribed before me.

MAX FROST, *Register.*
W. H. BAILHACHE, *Receiver.*

No. 54.] UNITED STATES LAND OFFICE,
Santa Fé, N. Mex., December 26, 1882.

It is hereby certified that under the provisions of the act of Congress approved March 3, 1877, entitled "An act to provide for the sale of desert lands in certain States and Territories," William F. Tucker, jr., has this day filed in this office his declaration of intention to reclaim the following-described tract of land, viz: The whole of Sec. 8, T. 12 N., R. 16 W.; that he has proven to our satisfaction that the said tract of land is desert land as defined in the second section of said act, and that he has paid to the receiver the sum of $160, being at the rate of 25 cents per acre for the land above described.

It is, therefore, further certified, that if within three years from the date hereof the said William F. Tucker, jr., his heirs or legal representatives, shall satisfactorily prove that the said land has been reclaimed by carrying water thereon, and shall pay to the receiver the additional sum of one dollar per acre for the land above described, he or they shall be entitled to receive a patent therefor under the provisions of the said act.

MAX FROST, *Register.*
W. H. BAILHACHE, *Receiver.*

$160.

NOTE.—The word "heirs" is substituted in this form for the word "assignee," the ecretary of the Interior having declined to recognize the assignment of desert land aims.

[Desert land act of March 3, 1877.]

AFFIDAVIT.

No. 54.] LAND OFFICE AT SANTA FÉ, N, MEX.,
November 22, 1882.

I, Orrin B. Stout, of Santa Fé County, Territory of New Mexico, being duly sworn, declare upon oath: That I am a resident of said county and Territory; that I am of the age of twenty-one years, and by occupation a clerk; that I am well acquainted with the character of each and every legal subdivision of the following-described land: Sec. 8, T. 12 N., R. 16 W., containing 640 acres; that I became acquainted with said land by personal observation; that I have been acquainted with it for two months last past; that I have frequently passed over it; that my knowledge of said land is such as to enable me to testify understandingly concerning it; that the same is desert land within the meaning of the second section of the act of Congress approved March 3, 1877, entitled "An act to provide for the sale of desert lands in certain States and Territories;" that said land will not, without artificial irrigation, produce any agricultural crop; that no agricultural crop has ever been raised or cultivated on said land for the reason that it does not contain sufficient moisture for successful cultivation; that the same is essentially dry and arid land, wholly unfit for cultivation without artificial irrigation; that said land cannot be successfully cultivated without reclamation by conducting water thereon; that said land has hitherto been unappropriated, unoccupied, and unsettled, because it has been impossible to cultivate it successfully on account of its dry and arid condition; that it is a fact, well known, patent, and notorious, that the same will not, in its natural condition, produce any crop; that the land is the tract described and desert land; that there is no timber growing thereon, but that it is devoid of timber; that there is not, to my knowledge, within the limits thereof, any vein or lode of quartz, or other rock in place, bearing gold, silver, cinnabar, lead, tin, or copper, or any deposit of coal; that there is not, within the limits of said land, to my knowledge, any placer, cement, gravel, or other valuable mineral deposit or salines; that no portion of said land is claimed for mining purposes under the local customs or rules of miners or otherwise; that no portion of said land is worked for mineral during any part of the year by any person or persons; that said land is essentially non-mineral land; that I am not interested in any way or manner, directly or indirectly, present or prospective, in any application or declaration made or to be made for said land, or in the land itself, or in the title which may by any person or in any manner be acquired thereto.

ORRIN B. STOUT.

LAND OFFICE AT SANTA FÉ, N. MEX.,
November 22, 1882.

I hereby certify that the above affidavit was taken and subscribed before me this day, and that Orrin B. Stout, whose name is affixed thereto, is a person of respectability, to whose testimony full credence should be given.

MAX FROST, *Register.*
W. H. BAILHACHE, *Receiver.*

[Desert land act of March 3, 1877.]

AFFIDAVIT.

No. 54.] LAND OFFICE AT SANTA FÉ, N. MEX.,
November 1, 1882.

I, Henry W. Lawton, of Santa Fé County, Territory New Mexico, being duly sworn, declare upon oath: That I am a resident of said county and Territory; that I am of the age of thirty-nine, and by occupation an Army officer; that I am well acquainted with the character of each and every legal subdivision of the following-described land Sec. 18, T. 12 N., R. 16 W., containing 640 acres; that I became acquainted with said land by personal observation; that I have been acquainted with it for one year last past; that I have frequently passed over it; that my knowledge of said land is such as to enable me to testify understandingly concerning it; that the same is desert land within the meaning of the second section of the act of Congress approved March 3, 1877, entitled "An act to provide for the sale of desert lands in certain States and Territories;" that said land will not, without artificial irrigation, produce any agricultural crop; that no agricultural crop has ever been raised or cultivated on said land for the reason that it does not contain sufficient moisture for successful cultivation; that the same is essentially dry and arid land, wholly unfit for cultivation without artificial irrigation; that said land cannot be successfully cultivated without reclamation by conducting water thereon; that said land has hitherto

been unappropriated, unoccupied, and unsettled, because it has been impossible to cultivate it successfully on account of its dry and arid condition; that it is a fact well known, patent, and notorious, that the same will not, in its natural condition, produce any crop; that the land is the tract described and is desert land; that there is no timber growing thereon, but that it is devoid of timber; that there is not, to my knowledge, within the limits thereof, any vein or lode of quartz, or other rock in place, bearing gold, silver, cinnabar, lead, tin, or copper, or any deposit of coal; that there is not, within the limits of said land, to my knowledge, any placer, cement, gravel, or other valuable mineral deposit or salines; that no portion of said land is claimed for mining purposes, under the local customs or rules of miners or otherwise; that no portion of said land is worked for mineral during any part of the year by any person or persons; that said land is essentially non-mineral land; that I am not interested in any way or manner, directly or indirectly, present or prospective, in any application or declaration made or to be made for said land, or in the land itself, or in the title which may by any person or in any manner be acquired thereto.

HENRY W. LAWTON.

LAND OFFICE AT SANTA FÉ, N. MEX.,
November 22, 1882.

I hereby certify that the above affidavit was taken and subscribed before me this day, and that deponent, whose name is affixed thereto, is a person of respectability, to whose testimony full credence should be given.

MAX FROST, *Register.*
W. H. BAILHACHE, *Receiver.*

[Desert land act of March 3, 1877.]

DECLARATION.

No. 54.] LAND OFFICE AT SANTA FÉ, N. MEX.,
November 22, 1883.

I, William F. Tucker, jr., of Santa Fé County, Territory of New Mexico, being duly sworn, depose and declare: That I am a citizen of the United States, of the age of twenty-eight years, and a resident of said county and ————, and by occupation an Army officer; that I intend to reclaim a tract of desert land, not exceeding one section, by conducting water upon the same, within three years from date, under the provisions of the act of Congress approved March 3, 1877, entitled "An act to provide for the sale of desert lands in certain States and Territories." The desert land which I intend to reclaim does not exceed one section, and is situated in Valencia County, in the Santa Fé land district, and is described as follows, to wit: the whole of Sec. 8, T. 12 N., R. 16 W., containing 640 acres. I further depose, that I have made no other declaration for desert lands under the provisions of said act; that the land above described will not, without irrigation, produce an agricultural crop; that there is no timber growing upon said land; that there is not, to my knowledge, within the limits thereof, any vein or lode of quartz, or other rock in place, bearing gold, silver, cinnabar, lead, tin, or copper, or any deposit of coal; that there is not within the limits of said land, to my knowledge, any placer, cement, gravel, or other valuable mineral deposit or salines; that no portion of said land is claimed for mining purposes, under the local customs or rules of miners or otherwise; that no portion of said land is worked for mineral during any part of the year by any person or persons; that said land is essentially non-mineral land; that I became acquainted with said land by personal observation, and that my declaration therefor is not made for the purpose of fraudulently obtaining title to mineral land, timber land, or agricultural land, but for the purpose of faithfully reclaiming, within three years from the date hereof, by conducting water thereon, a tract of land which is desert land within the meaning of the act.

WILLIAM F. TUCKER, JR.

LAND OFFICE AT SANTA FÉ, N. MEX.,
November 22, 1882.

I hereby certify that the foregoing declaration was this day sworn to and subscribed before me.

MAX FROST, *Register.*
W. H. BAILHACHE, *Receiver.*

No. 62.] UNITED STATES LAND OFFICE,
January 18, 1883.

It is hereby certified that under the provisions of the act of Congress approved March 3, 1877, entitled "An act to provide for the sale of desert lands in certain States

and Territories," Henry W. Lawton has this day filed in this office his declaration of intention to reclaim the following-described tract of land, viz: Sec. 24, T. 12 N., R. 17 W.; that he has proven to our satisfaction that the said tract of land is desert land as defined in the second section of said act, and that he has paid to the receiver the sum of $160, being at the rate of 25 cents per acre, for the land above described.

It is, therefore, further certified that if within three years from the date hereof the said Henry W. Lawton, his heirs or legal representatives, shall satisfactorily prove that the said land has been reclaimed by carrying water thereon, and shall pay to the receiver the additional sum of one dollar per acre for the land above described, he or they shall be entitled to receive a patent therefor under the provisions of the said act.

MAX FROST,
Register.
W. H. BAILHACHE,
Receiver.

$160.

NOTE.—The word "heirs" is substituted in this form for the word "assignee," the Secretary of the Interior having declined to recognize the assignment of Desert Land Claims.

[Desert land act of March 3, 1877.]

AFFIDAVIT.

No. 62.] LAND OFFICE AT SANTA FÉ, N. MEX.,
November 22, 1882.

I, Orrin B. Stout, of Santa Fé County, Territory of New Mexico, being duly sworn, declare upon oath: That I am a resident of said county and Territory; that I am of the age of twenty-one years, and by occupation a clerk; that I am well acquainted with the character of each and every legal subdivision of the following-described land; the whole of Sec. 24 T. 12 N., R. 17 W., containing 640 acres; that I became acquainted with said land by personal observation; that I have been acquainted with it for two months last past; that I have frequently passed over it; that my knowledge of said land is such as to enable me to testify understandingly concerning it; that the same is desert land within the meaning of the second section of the act of Congress approved March 3, 1877, entitled "An act to provide for the sale of desert lands in certain States and Territories"; that said land will not, without artificial irrigation, produce any agricultural crop; that no agricultural crop has ever been raised or cultivated on said land for the reason that it does not contain sufficient moisture for successful cultivation; that the same is essentially dry and arid land, wholly unfit for cultivation without artificial irrigation; that said land cannot be successfully cultivated without reclamation by conducting water thereon; that said land has hitherto been unappropriated, unoccupied, and unsettled, because it has been impossible to cultivate it successfully on account of its dry and arid condition; that it is a fact well known, patent, and notorious, that the same will not, in its natural condition, produce any crop; that the land is the land known as desert land; that there is no timber growing thereon, but that it is devoid of timber; that there is not, to my knowledge, within the limits thereof, any vein or lode of quartz, or other rock in place, bearing gold, silver, cinnabar, lead, tin, or copper, or any deposit of coal; that there is not, within the limits of said land, to my knowledge, any placer, cement, gravel, or other valuable mineral deposit or salines; that no portion of said land is claimed for mining purposes under the local customs or rules of miners or otherwise; that no portion of said land is worked for mineral during any part of the year by any person or persons; that said land is essentially non-mineral land; that I am not interested in any way or manner, directly or indirectly, present or prospective, in any application or declaration made or to be made for said land, or in the land itself, or in the title which may by any person or in any manner be acquired thereto.

ORRIN B. STOUT.

LAND OFFICE AT SANTA FÉ, N. MEX.,
November 22, 1882.

I hereby certify that the above affidavit was taken and subscribed before me this day, and that deponent, whose name is affixed thereto, is a person of respectability, to whose testimony full credence should be given.

MAX FROST,
Register.
W. H. BAILHACHE,
Receiver.

[Desert land act of March 3, 1877.]

AFFIDAVIT.

No. 62.] LAND OFFICE AT SANTA FÉ, N. MEX.,
November 22, 1882.

I, William F. Tucker, jr., of Santa Fé County, Territory New Mexico, being duly sworn, declare upon oath: That I am a resident of said county and Territory; that I am of the age of twenty-eight years, and by occupation an Army officer; that I am well acquainted with the character of each and every legal subdivision of the following-described land: Sec. 24, T. 12 N., R. 17 W., containing 160 acres; that I became acquainted with said land by personal observation that I have been acquainted with it for two months last past; that I have frequently passed over it; that my knowledge of said land is such as to enable me to testify understandingly concerning it; that the same is desert land within the meaning of the second section of the act of Congress approved March 3, 1877, entitled "An act to provide for the sale of desert lands in certain States and Territories"; that said land will not, without artificial irrigation, produce any agricultural crop; that no agricultural crop has ever been raised or cultivated on said land for the reason that it does not contain sufficient moisture for successful cultivation; that the same is essentially dry and arid land, wholly unfit for cultivation without artificial irrigation; that said land cannot be successfully cultivated without reclamation by conducting water thereon; that said land has hitherto been unappropriated, unoccupied, and unsettled, beacuse it has been impossible to cultivate it successfully on account of its dry and arid condition; that it is a fact well known, patent, and notorious, that the same will not, in its natural condition, produce any crop; that the land is the land known as desert land; that there is no timber growing thereon, but that it is devoid of timber; that there is not, to my knowledge, within the limits thereof, any vein or lode of quartz, or other rock in place bearing gold, silver, cinnabar, lead, tin, or copper, or any deposit of coal; that there is not, within the limits of said land, to my knowledge, any placer, cement, gravel, or other valuable mineral deposit or salines; that no portion of said land is claimed for mining purposes under the local customs or rules of miners or otherwise; that no portion of said land is worked for mineral during any part of the year by any person or persons; that said land is essentially non-mineral land; that I am not interested in any way or manner, directly or indirectly, present or prospective, in any application or declaration made or to be made for said land, or in the land itself, or in the title which may by any person or in any manner be acquired thereto.

WILLIAM F. TUCKER, JR.

LAND OFFICE AT SANTE FÉ, N. MEX.,
November 22, 1882.

I hereby certify that the above affidavit was taken and subscribed before me this day, and that deponent, whose name is affixed thereto, is a person of respectability, to whose testimony full credence should be given.

MAX FROST,
Register.
W. H. BAILHACHE,
Receiver.

[Desert land act of March 3, 1877.]

DECLARATION.

No. 62.] LAND OFFICE AT SANTA FÉ, N. MEX.,
November 22, 1882.

I, Henry W. Lawton, of Santa Fé County, Territory of New Mexico, being duly sworn, depose and declare: That I am a citizen of the United States, of the age of thirty-nine, and a resident of said county and Territory, and by occupation an Army officer; that I intend to reclaim a tract of desert land, not exceeding one section, by conducting water upon the same, within three years from date, under the provisions of the act of Congress approved March 3, 1877, entitled "An act to provide for the sale of desert lands in certain States and Territories." The desert land which I intend to reclaim does not exceed one section, and is situated in Valencia County, in the Santa Fé land district, and is described as follows, to wit: the whole of Sec. 24, T. 12

N., R. 17 W., containing 640 acres. I further depose, that I have made no other declaration for desert lands under the provisions of said act; that the land above described will not, without irrigation, produce an agricultural crop; that there is no timber growing upon said land; that there is not, to my knowledge, within the limits thereof, any vein or lode of quartz, or other rock in place, bearing gold, silver, cinnabar, lead, tin, or copper, or any deposit of coal; that there is not within the limits of said land, to my knowledge, any placer, cement, gravel, or other valuable mineral deposit or salines; that no portion of said land is claimed for mining purposes, under the local customs or rules of miners or otherwise; that no portion of said land is worked for mineral during any part of the year by any person or persons; that said land is essentially non-mineral land; that I became acquainted with said land by personal observation, and that my declaration therefor is not made for the purpose of fraudulently obtaining title to mineral land, timber land, or agricultural land, but for the purpose of faithfully reclaiming, within three years from the date hereof, by conducting water thereon, a tract of land which is desert land within the meaning of the act.

HENRY W. LAWTON.

LAND OFFICE AT SANTA FÉ, N. MEX.,
November 22, 1882.

I hereby certify that the foregoing declaration was this day sworn to and subscribed before me.

MAX FROST,
Register.
W. H. BAILHACHE,
Receiver.

Extract from the records of Captain Henry W. Lawton, 4th U. S. Cavalry.

VOLUNTEER SERVICE.

Sergeant Co. E, 9th Indiana Infantry, 18 April, 1861; discharged, 29 July; 1st lieutenant 30th Indiana Infantry, 24 September; captain, 17 May, 1862; lieutenant-colonel, 10 February, 1865; brevet colonel, 13 March; honorably mustered out, 25 November.

A true extract.

O. M. SMITH,
1st Lieut. and Adjt. 22nd Infantry, Actg. Asst. Adjt. General.

HD. QURS., DISTRICT OF NEW MEXICO,
Santa Fé, N. Mex., February 3, 1883.

WAR DEPARTMENT, ADJUTANT-GENERAL'S OFFICE,
Washington, D. C., June 9, 1883.

SIR: I have the honor to acknowledge the receipt of your letter of the 2d day of June, 1883, requesting a "statement of service" of Henry W. Lawton.

The following information has been obtained from the files of this office, and is respectfully furnished in reply to your inquiry.

It appears from the rolls on file in this office that Henry W. Lawton was enrolled on the 18th day of April, 1861, at Fort Wayne, in Company E, Ninth Regiment of Indiana Volunteers, to serve three months years, or during the war, and mustered into service as a sergeant on the 24th day of April, 1861, at Indianapolis, in Company E, Ninth Regiment of Indiana Volunteers, to serve three months years, or during the war. Mustered out with company July 29, 1861, at Indianapolis, Ind.

I am, sir, very respectfully, your obedient servant,

C. MCKEEVER,
Assistant Adjutant-General.
By D. E. NOLMUS.

TO COMMISSIONER GENERAL LAND OFFICE,
Washington, D. C.

[Receiver's receipt No. 1678. Application No. 1678.]

HOMESTEAD.

RECEIVER'S OFFICE, SANTA FÉ, N. MEX.,
January 27, 1883,

Received of Henry W. Lawton the sum of $22, being the amount of fee and compensation of register and receiver for the entry of SW. ¼ of Sec. 34, in T. 12 N., R. 17 W., under section No. 2290, Revised Statutes of the United States.

W. H. BAILHACHE,
Receiver.

$22.

NOTE.—It is required of the homestead settler that he shall reside upon and cultivate the land embraced in his homestead entry for a period of five years from the time of filing the affidavit, being also the date of entry. All abandonment of the land for more than six months works a forfeiture of the claim. Further, within two years from the expiration of the said five years he must file proof of his actual settlement and cultivation, failing to do which, his entry will be canceled. If the settler does not wish to remain five years on his tract, he can, at any time after six months, pay for it with cash or land warrants, upon making proof of settlement and cultivation from date of filing affidavit to the time of payment.

☞See note in red ink, which registers and receivers will read and explain thoroughly to persons making application for lands where the affidavit is made before either of them.

Timber land embraced in a homestead, or other entry not consummated, may be cleared in order to cultivate the land and improve the premises, *but for no other purpose.*

If, after clearing the land for cultivation, there remains more timber than is required for improvement, there is no objection to the settler disposing of the same. But the question whether the land is being cleared of its timber *for legitimate purposes* is a question *of fact* which is liable to be raised at any time. If the timber is cut and removed *for any other purpose* it will subject the entry to cancellation, and the person who cut it will be *liable to civil suit* for recovery of the value of said timber, ***and also to criminal prosecution*** under Section 2461 of the Revised Statutes,

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NON-MINERAL AFFIDAVIT.

COUNTY OF SANTA FÉ,
Territory of New Mexico, ss:

Henry W. Lawton, being duly sworn according to law, deposes and says that he is the identical person who is an applicant for Government title to the SW. ¼ Sec. 34, T. 12 N., R. 17 W.; that he is well acquainted with the character of said described land, and with each and every legal subdivision thereof, having frequently passed over the same; that his knowledge of said land is such as to enable him to testify understandingly with regard thereto; that there is not, to his knowledge, within the limits thereof, any vein or lode of quartz or other rock in place, bearing gold, silver, cinnabar, lead, tin, or copper, or any deposit of coal; that there is not within the limits of said land, to his knowledge, any placer, cement, gravel, or other valuable mineral deposit; that no portion of said land is claimed for mining purposes under the local customs or rules of miners or otherwise; that no portion of said land is worked for mineral during any part of the year by any person or persons; that said land is essentially non-mineral land, and that his application therefor is not made for the purpose of fraudulently obtaining title to mineral land, but with the object of securing said land for agricultural purposes.

HENRY W. LAWTON.

Subscribed and sworn to before me this 27 day of January, A. D. 1883, and I hereby certify that the foregoing affidavit was read to the said deponent previous to his name being subscribed thereto; and that deponent is a respectable person, to whose affidavit full faith and credit should be given.

MAX FROST,
Register.

[Soldiers and sailors' homesteads under act June 8, 1872.]

AFFIDAVIT.

No. 1678.] LAND OFFICE AT SANTA FÉ, N. MEX.,
January 27, 1883.

I, Henry W. Lawton, of Santa Fé County, New Mexico, do solemnly swear that I am a discharged soldier, of the age of twenty-one years, and a citizen of the United States; that I served for ninety days in Company E, Ninth Indiana Regiment United States Volunteers; that I was mustered into the United States military service the

18th day of April, 1861, and was honorably discharged therefrom on the 20th day of November, 1865; that I have since borne true allegiance to the Government; and that I have made my application No. 1678 to enter a tract of land under the provisions of the act of June 8, 1872, giving homesteads to honorably discharged soldiers and sailors, their widows and orphan children; that I have made said application in good faith; and that I take said homestead for the purpose of actual settlement and cultivation, and for my own exclusive use and benefit, and for the use and benefit of no other person or persons whomsoever; and that I have not heretofore acquired a title to a tract of land under this or the original homestead law, approved May 20, 1862, or the amendments thereto, or voluntarily relinquished, or abandoned, an entry heretofore made under said acts: So help me God.

HENRY W. LAWTON.

Sworn and subscribed to before me, Max Frost, register of the land office at Santa Fé, N. Mex., this 27th day of January, 1883.

MAX FROST.
Register.

[Soldiers and sailors' homesteads under act June 8, 1872.]

HOMESTEAD.

Application, No. 1678.] LAND OFFICE AT SANTA FÉ, N. MEX.,
January 27, 1883.

I, Henry W. Lawton, of Santa Fé County, New Mexico, do hereby apply to enter, under the provisions of the act of Jane 8, 1872, amendatory of an act entitled "An act to enable honorably discharged soldiers and sailors, their widows and orphan children, to secure homesteads on the public domain," the SW. ¼ Sec. 34, T. 12 N., R. 17 W., containing 160 acres.

HENRY W. LAWTON.

LAND OFFICE AT SANTA FÉ, N. MEX.,
January 27, 1883.

I, Max Frost, register of the land office, do hereby certify that Henry W. Lawton filed the above application at this office on the 27th day of January, 1883, and that he has taken the oath and paid the fees and commissions prescribed by law.

MAX FROST,
Register.

[Receiver's receipt, No. 1675. Application, No. 1675.]

HOMESTEAD.

RECEIVER'S OFFICE, SANTA FÉ, N. MEX.,
———— ————, 188–.

Received of William F. Tucker, jr., the sum of $22, being the amount of fee and compensation of register and receiver for the entry of S. ½ NE. ¼, N. ½ SE. ¼ of Sec. 34 in T. 12 N., R. 17 W., under section No. 2290, Revised Statutes of the United States.

W. H. BAILHACHE,
Receiver.

NOTE.—It is required of the homestead settler that he shall reside upon and cultivate the land embraced in his homestead entry for a period of five years from the time of filing the affidavit, being also the date of entry. An abandonment of the land for more than six months works a forfeiture of the claim. Further, within two years from the expiration of the said five years he must file proof of his actual settlement and cultivation, failing to do which, his entry will be canceled. If the settler does not wish to remain five years on his tract, he can, at any time after six months, pay for it with cash or land warrants, upon making proof of settlement and cultivation from date of filing affidavit to the time of payment.

☞See note in red ink, which registers and receivers will read and explain thoroughly to persons making application for lands where the affidavit is made before either of them.

Timber land embraced in a homestead, or other entry not consummated, may be cleared in order to cultivate the land and improve the premises, *but for no other purpose.*

If, after clearing the land for cultivation, there remains more timber than is required for improvement, there is no objection to the settler disposing of the same. But the question whether the land is being cleared of its timber *for legitimate purposes* is a question *of fact* which is liable to be raised at any time. If the timber is cut and removed *for any other purpose* it will subject the entry to cancellation, and the person who cut it will be *liable to civil suit* for recovery of the value of said timber, ***and also to criminal prosecution*** under section 2461 of the Revised Statutes.

HOMESTEAD.

[Affidavit.]

LAND OFFICE AT SANTA FÉ, N. MEX.,
January 26, 1883.

I, William F. Tucker, of Valencia County, New Mexico, having filed my application, No. 1675, for an entry under section No. 2289, Revised Statutes of the United States, do solemnly swear that I am a native born citizen of the United States, head of a family, over the age of twenty-one years, and claim settlement from this date, that said application, No. 1675, is made for the purpose of actual settlement and cultivation; that said entry is made for my own exclusive benefit, and not directly or indirectly for the benefit or use of any other person or persons whomsoever; and that I have not heretofore had the benefit of the homestead laws.

WILLIAM F. TUCKER, JR.

Sworn to and subscribed this 27th day of January, 1883, before
MAX FROST, *Register of the Land Office.*

NOTE.—If this affidavit be acknowledged before the clerk of the court, as provided for by section 2294, United States Revised Statutes, the homestead party must expressly state herein that he or some member of his family is residing upon the land applied for, and that *bona fide* improvement and settlement have been made. He must also state why he is unable to appear at the land office.

☞ See note, which clerks of the courts and registers and receivers will read and explain thoroughly to persons making application for lands where the affidavit is made before either of them. (See directions to land officers on duplicate receipt.)

Timber land embraced in a homestead, or other entry not consummated, may be cleared in order to cultivate the land and improve the premises, *but for no other purpose.*

If, after clearing the land for cultivation, there remains more timber than is required for improvement, there is no objection to the settler disposing of the same. But the question whether the land is being cleared of its timber *for legitimate purposes* is a question *of fact* which is liable to be raised at any time. If the timber is cut and removed *for any other purpose* it will subject the entry to cancellation, and the person who cut it will be *liable to civil suit* for recovery of the value of said timber, *and also to criminal prosecution* under section 2461 of the Revised Statutes.

NON-MINERAL AFFIDAVIT.

COUNTY OF SANTA FÉ,
Territory of New Mexico, ss.:

William F. Tucker being duly sworn according to law, deposes and says that he is the identical person who is an applicant for government title to the S. ½ NE. ¼, N. ½ SE. ¼, Sec. 34, T. 12 N., R. 17 W., that he is well acquainted with the character of said described land, and with each and every legal subdivision thereof, having frequently passed over the same; that his knowledge of said land is such as to enable him to testify understandingly with regard thereto; that there is not, to his knowledge, within the limits thereof, any vein or lode of quartz or other rock in place, bearing gold, silver, cinnabar, lead, tin, or copper, or any deposit of coal; that there is not within the limits of said land, to his knowledge, any placer, cement, gravel, or other valuable mineral deposit; that no portion of said land is claimed for mining purposes under the local customs or rules of miners or otherwise; that no portion of said land is worked for mineral during any part of the year by any person or persons; that said land is essentially non-mineral land, and that his application therefor is not made for the purpose of fraudulently obtaining title to mineral land, but with the object of securing said land for agricultural purposes.

WILLIAM F. TUCKER, JR.

Subscribed and sworn to before me this 27th day of January, A. D. 1883, and I hereby certify that the foregoing affidavit was read to the said deponent previous to his name being subscribed thereto; and that deponent is a respectable person to whose affidavit full faith and credit should be given.

MAX FROST, *Register.*

HOMESTEAD.

Application No. 1675.] LAND OFFICE AT SANTA FÉ, N. MEX.,
January 26, 1883.

I, William F. Tucker, of Valencia County, New Mexico, do hereby apply to enter, under section 2289, Revised Statutes of the United States, the S. ½ NE. ¼, N. ½ SE. ¼, Sec. 34, T. 12 N., R. 17 W., containing 160 acres.

WILLIAM F. TUCKER, JR.

LAND OFFICE AT SANTA FÉ, N. MEX.,
January 27, 1883.

I, Max Frost, register of the land office, do hereby certify that the above application is for surveyed lands of the class which the applicant is legally entitled to enter under section 2289, Revised Statutes of the United States, and that there is no prior valid adverse right to the same.

MAX FROST, *Receiver.*

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., February 17, 1883.

SIR: Referring to telegram from office of the 13th instant, suspending certain plats, you are informed that said suspension is ordered by reason of the surveys encroaching on the Zuni Indian Reservation as defined by executive order dated March 16, 1877, mailed to your office March 29, 1877. Deputy Armstrong in his surveys has disregarded the limits of this reservation. These plats will remain suspended until the lines of the reservation are marked in the field and the public lands segregated from the Indian lands. Please report if the deputy making these surveys was furnished with a copy of the executive order referred to, or had any knowledge of the existence of the Indian reservation.

Very respectfully,

N. C. McFARLAND,
Commissioner.

HENRY M. ATKINSON, Esq.,
United States Surveyor-General, Sata Fé, N. Mex.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., April 28, 1883.

SIR: I have received your letter, dated the 21st instant, stating that Deputy Armstrong is ready to return to the field and correct his survey of T. 12 N., R. 16 W., and T. 11 and 12 N., R. 17 W., of New Mexico principal meridian, by establishing Zuni Indian reservation boundary and closing the lines of public surveys thereon, and you request instructions in the matter.

In reply I have to state that the agent for said Indians has reported that the boundary line of said reservation as defined by the executive order dated March 16, 1877, if established in the field according to the courses and distances mentioned will not include the Nutrias and Ojo Pescado Springs, also mentioned in said order, and certain Indian settlements in the neighborhood of said springs, and I learn, informally, that a new executive order is being prepared correcting the description of said boundaries, and where the lands have been subdivided, taking certain legal subdivision lines for the Indian boundary. In case a new order shall be made you will be furnished with copy of it, and you will be further advised as to what is necessary in regard to surveying the reservation boundaries. You will, therefore, suspend any further survey of the boundary until further orders.

Very respectfully,

N. C. McFARLAND,
Commissioner.

HENRY M. ATKINSON, Esq.,
United States Surveyor-General, Santa Fé, N. Mex.

EXECUTIVE MANSION,
May 1, 1883.

Whereas it is found that certain descriptions as to boundaries given in an executive order issued March 16, 1877, setting apart a reservation in the Territory of New Mexico for the Zuni Pueblo Indians, are not stated with sufficient definiteness to include within said reservation all the lands specified in and intended to be covered by said executive order, especially the Nutria Springs and the Ojo Pescado, said executive order is hereby so amended that the description of the tract of land thereby set apart for the purposes therein named, shall read as follows:

Beginning at the one hundred and thirty-sixth mile-post on the west boundary line of the Territory of New Mexico, thence in a direct line to the southwest corner of T.

11 N., R. 18 W., thence east and north, following section-lines so as to include Sects. 1, 12, 13, 14, 22, 23, 24, 25, 26, 27, 28, 32, 33, 34, 35, and 36, in said township; thence from the northeast corner of said township on the range-line between ranges 17 and 18 west, to the third correction-line north; thence east on said correction-line to the nearest section-line in range 16, from whence a line due south would include the Zuni settlements in the region of Nutria and Nutria Springs and the Pescado Springs; thence south following section-lines to the township-line between Ts. 9 and 10 N., R. 16 W.; thence west on said township-line to the range-line between ranges 16 and 17 west; thence in a direct line to the one hundred and forty-eighth mile-post on the western boundary-line of said territory; thence north along said boundary-line to place of beginning.

CHESTER A. ARTHUR.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., May 9, 1883.

SIR: Referring to my letter to you dated the 28th ultimo, in reference to a proposed change in the boundaries of the Zuni Indian Reservation in New Mexico, I now transmit, herewith inclosed, copy of an executive order dated May 1, 1883, declaring a reservation for said Indians, with more definite boundaries than those mentioned in the original order, dated March 16, 1877.

You will observe that where the line passes through surveyed lands it is made to extend along section or township lines, and hence no further survey in the field to determine its boundaries will be required at this time if the records of your office afford sufficient data as to the true location of the Ojo Pescado and Nutria Springs to enable you to determine what section-lines will include them and constitute the reservation boundary.

The plats of Ts. 11 and 12 N., R. 16 and 17 W., and T. 11 N., R. 18 W., received with your letter dated December 29, 1882; also the plat of T. 10 N., R. 16 W., received with your letter dated March 20, 1882, are herewith returned by this day's mail, in a separate package, and upon receipt hereof you will lay down the line of reservation by said executive order in a distinctive color, if you have the necessary data in your office. If not you will at once send your deputy to the field and have him ascertain and report as to the true location of said springs with reference to the lines of public surveys; when the reservation shall have been plainly indicated on the township plats you will retransmit the duplicates to this office and the triplicates to the United States local land office, except those of Ts. 11 and 12 N., R. 17 W., which appear to fall entirely within the reservation and must therefore be retained in your office until further orders.

Very respectfully,

N. C. McFARLAND,
Commissioner.

HENRY M. ATKINSON, Esq.,
United States Surveyor-General, Santa Fé, N. Mex.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., May 9, 1883.

GENTLEMEN: Herewith inclosed is a copy of an Executive order dated May 1, 1883, declaring boundaries of the reservation for the Zuni Pueblo Indians in New Mexico somewhat modified from those contained in the original order establishing the reservation, dated March 16, 1877, so that the new boundary follows certain lines of public surveys where the lands along the line have been surveyed.

The surveyor-general has been directed, by letter of this date, to furnish you with plats showing the reservation line, and when you receive them you will be careful to allow no entries of or filings for any of the lands shown to be within the lines of reservation.

Please acknowledge receipt hereof.

Very respectfully,

N. C. McFARLAND,
Commissioner.

REGISTER and RECEIVER, UNITED STATES LAND OFFICE,
Santa Fé, N. Mex.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., June 2, 1883.

SIR: I am in receipt of your letter dated the 21st ultimo, retransmitting plats of Ts. 10, 11, and 12 N., R. 16 W., and T. 11 N., R. 18 W., New Mexico meridian, showing boundary of Zuni Indian Reservation by late Executive order.

Referring to that paragraph of letter from this office dated May 9, 1883, requiring you to retain in your office the plats of Ts. 11 and 12 N., R. 17 W., because they fall wholly within the Indian Reservation, I now have to modify that request in so far as relates to the duplicate plats of said townships, which you will mark upon the face or margin as falling within the Zuni Reservation and then forward them to this office, but retain in your office the triplicate plats as well as the originals.

Very respectfully,

L. HARRISON,
Acting Commissioner.

HENRY M. ATKINSON, Esq.
United States Surveyor-General,
Santa Fé, N. Mex.

[Telegram.]

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., June 28, 1884.

SIR: In compliance with your request of this morning, you are advised that the records of this office show that Orrin B. Stout entered Sec. 18, T. 12 N., R. 16 W.; that William F. Tucker, jr., entered Sec. 8, T. 12 N., R. 16 W., and that Henry N. Lawton entered Sec. 24, T. 12 N., R. 17 W. These entries are made under the desert land act, are within the limits of the Zuni Reservation, New Mexico, as established by Executive order of May 1, 1883, were made in December, 1882, and January, 1883, and stand intact upon our records.

N. C. McFARLAND,
Commissioner.

Hon. J. G. CANNON,
House of Representatives.

DEPARTMENT OF THE INTERIOR,
Washington, July 2, 1884.

DEAR SIR: In reply to your verbal inquiries concerning the Executive order of May 1, 1883, extending the Zuni Reservation, allow me to say, that the reservation of the Zuni Indians was established by Executive order dated March 16, 1877. An order of this character does not, of course, give the Indians title to the lands; it only withdraws the lands included within the reservation from the operation of the settlement laws.

On April 28, 1883, it was reported from the Indian Office that in draughting the Executive order establishing the said reservation there had been an error, leaving out of the reservation a large spring that was not only desirable, but necessary for the use of the Indians. I therefore requested the President to modify the order so as to include within the lands of the reservation said spring. I was verbally informed that certain army officers had made locations under the desert land act of lands in the vicinity of the spring that would be included in the reservation by the term of the new order, but that they had expressed a willingness to surrender their claims if the Government desired to have the lands for the Indians. I subsequently understood that Major Tucker was one of the officers who had made filing under said act. Major Tucker soon after informed me that the Indians did not use the waters of the spring and did not need either the water or the land.

On the 1st of February, 1884, I requested Mr. James Stevenson, of the Geological Bureau, who is very familiar with the reservation and the surrounding country, to make an examination of the said spring and the amount of water on the reservation, and to report to me. In April last he made his report, by which it appears that the Indians on the reservation have made no use of the water of the spring mentioned, and have not occupied, either before or since, the lands included in the new lines of the reservation.

There is not the slightest evidence that any wrong was intended or done by the parties to the entries above referred to, or any law violated. The land was public land

at the time these entries were made, and as such was open to entry by the public. The gentlemen who made the entries were qualified to enter such lands, and had a perfect right to do so, and they neither violated law nor the rights of any parties whatever in so doing. I asked the Executive order extending this reservation without understanding all the facts at the time. It gives me pleasure to make this statement in view of the allegations to the contrary which have been made.

Very respectfully,

H. M. TELLER,
Secretary.

Hon. JOHN A. LOGAN,
United States Senate Chamber.

DEPARTMENT OF THE INTERIOR,
July 2, 1884.

SIR: In compliance with your verbal request of this date I have the honor to inclose herewith copy of letter from W. F. Tucker, jr., U. S. A., of May 3, 1883, relative to certain lands in New Mexico, and also copy of outline sketch of the Zuni Indian Reservation.

Very respectfully,

H. M. TELLER,
Secretary.

Hon. JOHN A. LOGAN,
United States Senate.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 12.

ANNUAL REPORT

OF THE

ATTORNEY-GENERAL

OF THE

UNITED STATES

FOR

THE YEAR 1884.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1884.

ANNUAL REPORT

OF THE

ATTORNEY-GENERAL

FOR

THE FISCAL YEAR ENDING JUNE 30, 1884.

DECEMBER 4, 1884.—Referred to the Committee on the Judiciary and ordered to be printed.

DEPARTMENT OF JUSTICE,
Washington, December 1, 1884.

SIR: I have the honor to transmit herewith my annual report for the year 1884.

Very respectfully, your obedient servant,

BENJAMIN HARRIS BREWSTER,
Attorney-General.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

REPORT

OF

THE ATTORNEY-GENERAL.

DEPARTMENT OF JUSTICE,
Washington, D. C., December 1, 1884.

To the Senate and House of Representatives of the United States in Congress assembled:

The following report is respectfully submitted of the business of the Department of Justice during the fiscal year ending June 30, 1884, together with statistics of crime against the United States, and a statement of the appropriations under the control of the Attorney-General, and such other matters as are embraced in sections 384 and 385 of the Revised Statutes.

SUPREME COURT OF THE UNITED STATES.

The condition of the docket of the Supreme Court of the United States at the close of the last term (October term, 1883), when compared with its condition at the close of the term next preceding, exhibits a decrease of 26 cases in the number left undisposed of on the two dockets, the appellate and the original.

At the close of the October term, 1882, there remained undisposed of on the appellate docket 868 cases and on the original docket 6. The number of cases docketed at the October term, 1883, was 439, of which 427 were on the appellate and 12 on the original docket, making the total number of cases on the docket at that term 1,313, of which 1,295 were on the appellate and 18 on the original docket. Of this number 848 were not disposed of, and of these 845 were on the appellate and 3 on the original docket.

The number of cases actually brought under consideration was 312, of which 207 were argued orally and 105 submitted on printed arguments.

Of the 450 cases on the appellate docket disposed of, 193 were affirmed, 102 reversed, 49 dismissed, 79 settled and dismissed by the parties, 23 docketed and dismissed under the 9th rule, and in 4 cases questions certified to the court were answered.

The number of cases decided at this term in which the United States were concerned was 48, of which 22 were decided in favor of and 21 against the United States, and in 5 criminal cases questions certified were answered.

Of those in which the United States appealed 17 were affirmed and 10 reversed. Thirteen of the cases were appeals from the Court of Claims, in 10 of which judgment was affirmed and in 3 reversed. Besides the cases in which the United States were concerned that were decided there were 20 others which were dismissed by the court, and of these 10 were dismissed at the instance of the United States and 10 at the instance of the other side.

Thus the total number of cases disposed of at the October term, 1883, in which the United States were interested is 68.

The above does not include 4 cases on the original docket in which the United States were interested, and 3 cases on the appellate docket from the Court of Claims in which the District of Columbia was a party.

COURT OF CLAIMS.

Since the last report 365 suits, claiming upwards of $7,900,000 have been brought under the ordinary jurisdiction of the court, and the total number of such cases pending is 1,533, claiming upwards of $38,000,000.

Under the act of March 3, 1883, Ch. 116, committees of the Senate have transmitted to the court 22 claims, and committees of the House of Representatives 317 claims, amounting in the aggregate to about $4,000,000.

Under the same act there have been 18 claims transmitted by heads of Executive Departments, amounting in the aggregate to upwards of $3,500,000.

The following is a summary of the business of the last term:

CLAIMS AGAINST THE UNITED STATES.

There were brought to trial 94 suits, claiming $823,609.47. In 28 of these, claiming $100,907.57, judgment was for defendants, and in 66 suits, claiming $722,701.90, judgment was for claimants for $221,678.68.

One hundred and eighty-four suits, claiming $3,394,975.70, were dismissed under the rules, on motion, for want of jurisdiction, or prosecution, or by consent.

In six cases judgment was recovered on counter-claim in favor of the United States, for $29,002.11.

CLAIMS AGAINST THE DISTRICT OF COLUMBIA.

Of these, 34 suits, claiming $752,386.79, were brought to trial. In 12 of them, claiming $393,203.71, judgment was for defendant. In 22 suits, claiming $359,183.08, judgment was for claimants for $75,467.50.

Ninety-two suits, claiming $1,457,974.34, were dismissed under the rules, or by consent.

In two cases judgments were recovered on counter-claims, in favor of the District for $7,197.95.

It is expected that all remaining suits against the District will be finally disposed of during the next term.

Whole number of cases disposed of by judgment	409
Amount claimed in them	$6,428,946 30
For defendants, 316 cases, claiming	5,347,061 32
For claimants, 93 cases, claiming	1,081,884 98
Amount recovered by claimants therein	297,146 16
Amount recovered by defendants on counter-claim	36,200 06

REPORTS UNDER ACT MARCH 3, 1883.

To committees of Congress (no jurisdiction)	3
To heads of Departments	8
In favor of four claims aggregating	$2,727 44
Against four claims aggregating	1,830,244 35

The tabular statement of United States suits presented with previous reports is annexed with additions to date (Exhibit E).

EXHIBITS.

Exhibit A is a statement of the civil suits to which the United States was a party, terminated in the circuit and district courts of the United States during the fiscal year ending June 30, 1884, and of such suits pending in said courts July 1, 1884, as reported by the district attorneys. During the last fiscal year 1,548 civil suits were terminated. In 643 of these judgments were for the United States, in 116 for the defendants, and 759 were either *nol. pros.*, dismissed, or discontinued; 12 were appealed from the district to the circuit court, and 18 from the circuit to the Supreme Court. Many of the civil suits reported *nol. pros.*, dismissed, or discontinued were settled by authority of the Treasury Department, and discontinued under its direction. There were pending, July, 6, 152 civil suits to which the United States was a party.

Exhibit B is a statement of the criminal prosecutions terminated in the circuit and district courts of the United States during the last fiscal year and of such prosecutions pending July 1, 1884. There were terminated during the last year 12,542 criminal prosecutions; 491 of these were prosecutions under the custom laws, in which there were 230 convictions, 43 acquittals, and 218 were entered *nol. pros.*, discontinued, or quashed; 5,026 under the internal-revenue laws, in which were 2,974 convictions, 633 acquittals, and 1,419 were entered *nol. pros.*, discontinued, or quashed; 758 under post-office laws, in which there were 375 convictions, 72 acquittals, and 311 entered *nol. pros.*, discontinued, or quashed; 190 under the election laws, in which there were 26 convictions, 23 acquittals, and 141 entered *nol. pros.*, discontinued, or quashed; 23 under civil-rights acts, in which there were 3 acquittals, and 20 entered *nol. pros.*, discontinued, or quashed; 5 under the naturali-

zation laws, all of which were convictions; 682 under the intercourse acts, in which there were 478 convictions, 81 acquittals, and 123 entered *nol. pros.*, discontinued, or quashed; 260 under the pension laws, in which there were 173 convictions, 47 acquittals, and 40 entered *nol. pros.*, discontinued, or quashed; 38 for embezzlement, in which there were 12 convictions, 11 acquittals, and 22 entered *nol. pros.*, discontinued, or quashed; 5,069 miscellaneous prosecutions, in which there were 3,235 convictions, 1,038 acquittals, 796 entered *nol. pros.*, discontinued, or quashed.

In many of the prosecutions under the internal-revenue laws entered *nol. pros.*, discontinued, or quashed a compromise and settlement was made in the Internal Revenue Bureau of the Treasury Department.

There were pending 5,437 criminal prosecutions, viz: 148 for violation of customs laws, 2,285 for violation of internal revenue laws, 399 for violation of post-office laws; 118 for violation of election laws, 7 for naturalization laws, 87 under intercourse laws, 244 under pension laws, 47 embezzlement, 2,102 miscellaneous prosecutions.

Exhibit C shows the amount from civil suits to which the United States was a party and from criminal prosecutions in the circuit and district courts of the United States during the last fiscal year.

The aggregate amount of judgments rendered in favor of the United States in civil suits during the last year was $845,377.31, and the amount actually collected on these judgments was $196,622.03, while $82,181.97 was obtained during the year on judgments rendered in former years for the United States and $155,813.91 was otherwise realized in civil suits.

The aggregate amount of fines, forfeitures, and penalties imposed during the year in criminal prosecutions was $345,377.30, and the amount of these fines, forfeitures, and penalties collected during the year was $82,717.90, while $8,695.14 was realized on fines, forfeitures, and penalties imposed in former years.

Exhibit D is a statement of civil suits to which the United States was not a party, commenced and terminated in the circuit and district courts of the United States during the last fiscal year; and of such suits pending July 1, 1884, 11,700 were commenced during the year, of which 2,378 were cases in admiralty and 9,322 were other miscellaneous suits; 8,738 were terminated last year, of which 1,626 were cases in admiralty and 7,112 were other miscellaneous suits.

Judgments for plaintiffs in these cases were as follows: 775 in admiralty, amounting to $749,980.57; 3,706 in other suits, amounting to $24,504,215.23.

Judgments for defendants were 342 in admiralty, amounting to $55,012.49, and 1,755 in other suits, amounting to $899,085.59; 509 in admiralty were either dismissed or discontinued, as were also 1,651 other suits; 30,372 civil suits to which the United States was not a party were

pending in the circuit and district courts of the United States July 1, 1884, viz, 3,989 in admiralty, and 26,383 other miscellaneous suits.

Exhibit E is a tabular statement of causes heretofore disposed of, and also of those now pending in the Court of Claims.

Exhibit F is a general statement of all appropriations placed under the Department of Justice which were available, and those from which payments were made during the fiscal year ending June 30, 1884.

Exhibit G is a statement showing items, amounts, cause of expenditure, and persons paid from the contingent fund for the fiscal year ending June 30, 1884.

Exhibit H is the report of the librarian, showing the needs and condition of the library, and the receipt and distribution of the Statutes of the United States and reports of the Supreme Court.

Exhibit J is the report of the Architect of the Capitol, of the improvement and repairs to the court-house in the city of Washington during the last fiscal year.

Exhibit K is a statement of the court expenses incurred in the fiscal years 1880, 1881, and 1882, and paid in the fiscal year 1884.

Exhibit L is a statement of the court expenses incurred in the fiscal year 1883, and paid in the fiscal year 1884.

Exhibit M is a statement of the court expenses incurred and paid in the fiscal year 1884, viz:

To United States marshals	$601,432 67
Attorneys	311,242 49
Clerks	127,207 12
Jurors	456,690 00
Witnesses	609,599 65
Commissioners	92,049 06
Prisoners	232,255 69
Rents	37,149 20
Miscellaneous expenses	294,605 48
Amounting to	2,762,234 36

Exhibit N *a* is a statement of payments in the fiscal year 1884 out of specific appropriations for court expenses for 1879 and prior years.

Exhibit N *b* is a statement of expenses paid during the fiscal year 1884 out of appropriation for payment of special deputy marshals at Congressional elections in 1881 and prior years.

Exhibit N *c* is a statement of payments made during the fiscal year 1884 to supervisors at Congressional elections in November, 1882.

Exhibit O shows the number of assistant attorneys, regular and special, and the compensation paid to each, as required by sections 385 and 195 of the Revised Statutes.

Exhibit P is the report of the Solicitor of the Treasury, showing the amount, character, and results of the litigations under his direction for the fiscal year ending June 30, 1884.

Exhibit Q is a letter from Thomas Boles, United States marshal for

the western district of Arkansas, giving a detailed description of the jail at Fort Smith.

Exhibit R is the annual report of the president of the board of trustees of the Reform School for the fiscal year ending June 30, 1884.

Exhibit S is the annual report of the warden of the United States jail in the District of Columbia.

Exhibit T is a copy of a letter from E. A. Ireland, United States marshal for the Territory of Utah, concerning the penitentiary in that Territory.

Exhibit U is a copy of letters from John Schuyler Crosby, governor, and A. C. Botkin, marshal, of Montana, concerning the penitentiary in that Territory.

Exhibit V is a letter from the First Comptroller relative to the adjustment of emolument accounts of judicial officers.

Exhibit W is a report of the Court of Commissioners of Alabama Claims.

EXPENSES OF THE UNITED STATES COURTS.

The expenses of the courts, when finally ascertained for a fiscal year, usually reach $3,000,000. It is not prudent to suppose that they will fall below this sum in any year. The character of the expenses changes somewhat year after year, but the gross amount remains nearly the same. The appropriation for these expenses in subdivisions, according to the character of the expense, is of much value to the Department, especially in making advances to marshals. Each subdivision stands for itself alone, and is not available for any other appropriation. This fact makes the gross sum for all the appropriations larger than when one appropriation is made for all the expenses. It is a necessary consequence of the subdivision, although such subdivision serves to check the general expenses.

An increase of court expenses must be expected from the creation of new judicial districts, which are frequently established by Congress. The sum asked for does not exceed the usual annual appropriations and the subsequent deficiencies made necessary by limited appropriations.

The provisions of the bill, chapter 436, approved August 7, 1880, for service of process, &c., applicable to the Territories of New Mexico and Arizona might justly be extended to the Territories of Montana, Idaho, Washington, Wyoming, and Utah. It is respectfully submitted that in Territories where the expenses of service are greater than the legal fees, the fees of the marshals should be doubled, since other Territories now have that privilege.

WITNESSES.

I repeat my former suggestion respecting witnesses for an accused person unable to pay such witnesses as he may need, as follows:

Section 878, Revised Statutes, gives to persons indicted in the courts of the United States an advantage, which few, if any, of the States confer. If any person so in-

dicted makes affidavit setting forth that there are witnesses material to his defense, that he cannot safely go to trial without them, what he expects to prove by each of them, &c., and that sufficient means are not at his disposal to enable him to pay the expenses of such witnesses, the courts or any judge thereof in vacation may order such witnesses, if found within the limits of the district in which the court is held, or within one hundred miles of the place of trial, to be subpœnaed. In such case the costs incurred by the service of process and fees of witnesses are paid in the same manner as similar costs and fees are paid when witnesses are subpœnaed in behalf of the United States. By this means large numbers of witnesses are often summoned on behalf of defendants whose presence is not necessary to a fair trial of the case. This privilege is one which entails a heavy expense upon the Government. It should be thoroughly guarded, and no witnesses should be allowed to be summoned merely for the purpose of attesting or attacking the credibility of other witnesses, which is one of the most frequent modes of multiplying such witnesses. I recommend that the number which the United States shall be required to summon and pay for any defendant shall not exceed four witnesses (except in capital cases), unless their materiality and importance are first approved and certified to by the district attorney for the district in which the examination is had, and such taxation shall be subject to revision, as in other cases.

FEES OF WITNESSES AND JURORS IN TERRITORIES.

The acts of February 26, 1853 (10 Statutes at Large, page 167), and May 1, 1876 (19 Statutes at Large, page 41, section 848, Revised Statutes United States), provide that witnesses of the United States shall receive for attendance in court or before any officer pursuant to law, $1.50 per day and 5 cents a mile for going from his place of residence to the place of trial or hearing, and 5 cents a mile for returning.

In the districts of California, Oregon, Nevada, and all the Territories the actual cost of subsistence is from $2 to $4 per day, and the cost of transportation from 5 to 20 cents per mile. When it is considered that the places of holding court in the districts mentioned are at great distances apart, often 200 or 300 miles, and that the necessary mode of travel is by stage, it will be seen that a citizen serves in the capacity of a United States witness at a great pecuniary loss and personal inconvenience. It is believed that this inadequate compensation causes many of the suits and prosecutions on behalf of the Government to fail because of the ill-will of the witnesses. Witnesses frequently avoid a summons, thus defeating justice, or, if served, decline to obey, in order to compel the marshal to arrest them under a bench warrant, preferring to be taken to court as prisoners at the Government's expense rather than to pay their own expenses without any hope of being reimbursed.

Under the act of June 30, 1879 (21 Statutes at Large, page 43), jurors receive a per diem of $2, and under the act of July 15, 1870 (section 852, Revised Statutes of the United States), 5 cents per mile for the distance necessarily traveled from their residence, going and returning from said court by the shortest practicable route.

The actual expenses of jurors are the same as those of witnesses in the districts mentioned, and there can be no doubt that the interests

of the Government are injured and great injustice done citizens called upon to serve in either of these capacities by the insufficiency of the compensation allowed under the present law.

It is therefore recommended that some additional legislation be enacted to relieve the people of the hardships now necessarily inflicted upon them by the administration of justice in the United States courts. It would seem that the most equitable provision that could be made would be a law providing that witnesses and jurors in the districts of California, Oregon, Nevada, and all of the Territories be paid their actual expenses in going to, while in attendance upon court, and returning to their places of residence, in lieu of the mileage and per diem now allowed by law. The justice and propriety of such a provision of law has already been recognized by Congress, as will be seen by reference to the last clause of section 829, Revised Statutes of the United States, which provides that United States marshals may charge the actual expense of executing process in any case where the fees provided by law do not cover their disbursements, and by the act of June 16, 1880, which provides that witnesses and jurors in the courts of the United States in Colorado shall be entitled to receive 15 cents for each mile actually traveled in going to or returning from said courts.

At the last Congress several letters from judges and other court officers, urging the necessity for action upon this matter, were referred by this Department to the chairman of the Judiciary Committee of the House of Representatives.

DISTRICT ATTORNEYS IN NEW MEXICO AND ARIZONA.

In the bill approved August 7, 1882, the maximum annual compensation of the district attorneys for the Territories of New Mexico and Arizona is limited to $3,500. Unless peculiar reasons exist for such limitation in their cases which are unknown to this Department, their maximum should equitably be the same as that fixed for all other district attorneys, namely, $6,000.

TERRITORIAL JUDGES.

Under the provision of existing laws there are appointed in each of the Territories (except Dakota) one chief justice and two associate justices. Much complaint is made by the bar and citizens having business before Territorial courts that the same judge who presides at the trials in the district courts also sits in the supreme court when his decisions are reviewed. The justice of these complaints is so apparent that comment is unnecessary. The matter is therefore submitted for your consideration. Since it is essential that the supreme court of each Territory should be composed of an uneven number of judges, the public interest requires that a fourth judge should be apppointed in each of the Territories if the judge sitting below is not to sit in review of his cases.

Moreover, the business in each of the Territories is sufficient to justify the appointment of another judge, making four instead of three. There is, therefore, no reason why Congress should not grant the citizens of the several Territories the relief they ask in this respect.

CLERKS OF COURTS.

It is respectfully recommended that the maximum compensation of all clerks in the United States courts be uniform. Whatever reasons might once have existed for allowing greater maximum compensation to a few do not now, it is believed, hold good. Reference is made to the clerks of the circuit and district courts of the United States in California. The maximum compensation of each of these clerks is $7,000 per annum. The maximum compensation for clerks of corresponding courts in other States throughout the country is $3,500. There appears to be no good reason for this discrimination in favor of the clerks of California. They are now allowed to receive double the maximum compensation of the clerks in other districts.

RECORDS OF CLERK'S OFFICE, SPRINGFIELD, ILL.

On February 2, 1880, the clerk of the district court at Springfield, Ill., died. After his death it was ascertained that the records of the court were incomplete, not having been entered for several years. The administrator of the clerk's estate proposed, if permission could be had from the local court, to employ competent clerks to make the necessary entries. I have not considered it wise to allow unofficial persons to undertake a work of this importance, and as there are no funds at my disposal to meet an emergency of this character, I recommend that Congress make a suitable appropriation for making the necessary records under the direction of the Attorney-General.

RESPECTING FUNDS PAID INTO COURT.

The act of March 24, 1871 (chap. 11, p. 1, 17 United States Statutes at Large), entitled "An act relating to moneys paid in the courts of the United States," passed for the better security of moneys deposited in the courts of the United States, directs that they may be deposited to the credit of the judge of the court, subject to his draft. It has been found that this is not an adequate security for the funds. The judge of the court is empowered to appoint his clerk. The statute makes the clerk keep a record of amounts deposited and amounts withdrawn, and to report the same at the opening of each term of court to the judge. Should it happen that moneys deposited in the name of the United States are withdrawn by the clerk under a general authority of the judge and misappropriated, and the clerk be irresponsible financially or beyond the reach of the process of court, there seems to be no remedy except against the judge. It is suggested that this defect may be cured

by proper legislation: by making the court or its fiduciary agent give bond to the United States in a sufficient sum to cover all moneys deposited in its keeping. A clerk in whom the judge has implicit confidence may neglect to deposit funds, and retain in his own possession moneys deposited to the credit of the United States without the knowledge of the judge, and contrary to his express orders. The clerk is allowed to charge a fee for receiving and paying out such moneys. His ordinary bond is for the good keeping of his office and the discharge of his official duties.

CHANGE OF EMOLUMENT YEAR TO FISCAL YEAR RECOMMENDED BY THE FIRST COMPTROLLER OF THE TREASURY.

Your attention is respectfully directed to a letter dated November 1, 1882, from the First Comptroller of the Treasury, a copy of which is hereunto annexed, marked Exhibit V, in which that officer recommends that section 843 of the Revised Statutes be so amended that all emolument returns of district attorneys, clerks, and marshals shall hereafter be settled for fiscal years, as other accounts are settled, by striking out the word "calendar" from such section and inserting in its place the word "fiscal." As such change would facilitate the settlement of the accounts, the adoption of the suggestion is recommended to your consideration.

PROTECTION TO CIVIL OFFICERS.

I renew the recommendation that additional legislation should be had to protect the executive civil officers of the Government in the performance of their duties and against outrages committed upon them because they have faithfully performed them. The punishment now attached to the resistance of process is not commensurate with many offenses which have been committed upon and against these officers. There is no United States punishment for the murder of one of these officers while engaged in discharging his duties or because he has discharged them. This is a matter which should not be left to the administration of justice in the State courts. A proper regard for the safety of the officer requires that the legislation should be ample and cover all outrages, but especially the highest outrage, upon his person.

UTAH.

The legislature of the Territory of Utah refuses to appropriate funds for the execution of the Territorial laws under Congressional legislation. If this legislation is to be maintained special appropriations must therefore be made annually to meet the demands of justice. The legislature has persisted for several years in this course, and thus has escaped the charge borne by all other Territories. This amounts to about $30,000 annually, and should also be appropriated for the fiscal year ending June 30, 1886. The increased immigration to the Territory and the

condition of affairs therein show that this appropriation annually is a necessity for the due execution of the laws within its bounds.

TERRITORY OF ALASKA.

In the act providing for a civil government in Alaska the Attorney General is directed to compile and cause to be printed so much of the general laws of the United States as is applicable to the duties of the officers of the said district, and an appropriation of $500 was made for that purpose. This compilation has been made and a number of copies sent to each of the officers of the Territory.

It was also provided in the act that those officers should be furnished with as many copies as might be needed of the laws of Oregon applicable to the new district. Difficulty has been experienced in obtaining some of the necessary copies of these laws, and I am in correspondence with a number of law-book firms throughout the country to procure them. As soon as I have succeeded in getting the required copies they also will be sent to the officers of Alaska.

COURT OF COMMISSIONERS OF ALABAMA CLAIMS.

The attention of Congress is called to the accompanying report concerning the Court of Commissioners of Alabama Claims, marked Exhibit W.

CHIEF SUPERVISORS OF ELECTIONS.

The statutes that create chief supervisors of elections and define their duties and fix their compensation do not place them under the control of any Department of the Government. For years the approval of their accounts and disbursements of the appropriation for their payment has devolved upon the Attorney-General. Under the authority thus thrust upon them my predecessors have examined the accounts of these officers, and exposed and checked many unnecessary expenses, and I have also had occasion to make large reductions while investigating these accounts.

The reductions have been made in instances where the services appeared to be merely constructive and their payment injudicious. The head of some Department ought to have the duty assigned to him to regulate these matters, and to systematize the work of the chief supervisors. At present they do not show sufficient regard for the public interests and the proper execution of the law to entitle them to interpret it according to their own wishes in the matter of their compensation. They are too easily led into ingenious devices for creating large bills. The Department to which this duty is assigned must be empowered to review their whole proceedings and adjust their claims upon a scale suited to the locality, density of population, and emergency of the occasion.

It is suggested that all accounts of chief supervisors should be taxed in open court under the inspection and examination of the district attorney or his sworn assistant, and that they must then be forwarded to the proper Department for further examination and reduction, if deemed advisable and necessary.

These laws are of the highest importance to the general welfare, and their proper execution a matter of prime necessity. Their abuse, on the other hand, is a great public wrong, to be guarded against by appropriate legislation.

OUTGOING MARSHALS.

The statutes authorizing outgoing marshals to execute all processes in their hands at the expiration of their commissions, has led to confusion and conflict of authority in some of the districts, as well as to a delay in the settlement of their accounts. It is therefore recommended that marshals be required to turn over to their successors in office all unfinished business of every kind in their hands at the time of the qualification of their successors.

A further reason for this recommendation lies in the fact that at times outgoing marshals refuse to turn over the records of their office to their successors until forced to do so by threatened prosecution, causing confusion and delay in the transaction of business. This would be avoided by changing the law as above suggested.

REVISION OF FEE BILL.

In view of the fact that most of the fraudulent accounts presented to the Treasury have been rendered by deputy marshals who, in many instances, have not been allowed by the marshals sufficient compensation to cover their expenses and subsistence, I earnestly recommend that the fee bill be so amended as to require the marshal to pay the deputies serving process or performing other duties not less than one-half of their net earnings, unless Congress should see fit to give marshals a stated salary as recommended in this report. This was the opinion I held in my report for the years 1882–'83. The experience acquired confirms me in reasserting the same ideas, being convinced that it is only by a wise readjustment of fees or salaries to United States marshals that justice can be done, and expenses properly curtailed. An early revision of the fee bill seems to be necessary. I therefore recommend to Congress that proper steps be taken for the accomplishment of this object, and that the officers of this Department and the Treasury be consulted as to the working of the present fee bill, and the proposed amendments thereto. It has been thirty years since the whole fee bill was revised. Within this time there has been much new legislation, and a variety of suits have been carried on that were not contemplated at the time of the passage of the original fee bill. The mere statement of this fact shows the reasonableness of the proposed revision.

SALARIES FOR MARSHALS AND ATTORNEYS.

The practice of compensating the United States marshal by fees is an expensive one. Examiners of the Department of Justice who have been detailed to examine their accounts report that, in order to make the maximum fees of the office ($6,000 per annum), unscrupulous marshals in some instances, through their deputies, have encouraged frivolous prosecutions, outraging the rights of citizens and involving the United States in unnecessary and excessive expense. It is estimated that it costs the Government $10 in expenses for every dollar of the marshal's emoluments, which shows that it would be to the interest of the Government to give the marshal a fixed compensation, so as to remove all inducement to perpetrate frauds upon the Government and wrongs upon the citizen. If the deputies were paid fees for executing process, it would insure the same efficiency as the present fee system, and at the same time relieve the Department of the extraordinary expense complained of, as the marshal would have no interest in encouraging such practices.

The same reasons in favor of salaried officers apply with even more force to the United States attorney. By law he is required to examine the accounts of marshals, clerks, and commissioners. It is therefore clear that the emoluments of his office ought not to be contingent upon the amount of business done by officers upon the correctness of whose accounts he must pass.

The interests of the Government would be protected in fixing the compensation of marshals and attorneys by taking as a basis an estimate of the business transacted during the past ten years. To protect the Government against paying excessive salaries in districts where the business has heretofore been worked up by the institution of frivolous cases, for the sole purpose of increasing fees, I respectfully recommend that Congress give the Attorney-General the authority, at his discretion, to adjust salaries of marshals at the close of each fiscal year, increasing or diminishing the same for the next fiscal year, upon some basis to be fixed by law. In this manner justice could be done both to the United States and its officers.

CRIMINAL PROCEDURE.

It is desirable that the attention of Congress should be directed to the want of proper legislation for criminal cases, in order that the pleadings may be simplified, a uniform system of challenges provided, and the trials shorn of the technical objections and numberless dilatory motions that can now be interposed to prevent a speedy trial upon the merits.

In preparing indictments for offenses against the United States it is found necessary to follow the common-law forms of the last century, with all the technicalities, verbosity of descriptions, repetitions, and

precision of statements formerly required, whereby that which should be a simple and concise written accusation becomes a lengthy and painfully confused mass of descriptions and allegations, wholly unintelligible to the defendant who is called upon to answer, or to the jury selected to try the case.

To reduce pleadings to a plain and comprehensive statement of the facts would serve equally to the advantage of the Government and the defendant. There is no reason why an indictment ought not to be adjudged sufficient and good in law which charges the crime substantially in the language of the act prohibiting the crime and prescribing the punishment, or so plainly that the nature of the offense charged may be easily understood by the jury.

When it is necessary to describe or make an averment of any written or printed instrument, as the law now stands, such instrument must be copied into the indictment with literal exactness equal to a photographic reproduction. The omission of a word that appears almost undiscernible among the lines and flourishes created by the skill of the engraver or penman would be a fatal defect that might enable a guilty man to escape punishment. It is also now necessary in some cases to set out in the indictment the value of such an instrument. As values are matters of opinion, a guilty defendant should not be permitted to escape by reason of a conflict of testimony upon this subject. It is suggested that it would be sufficient to aver or describe every such instrument by any name or designation by which the same may be usually known, or by its purport, and in such manner as to sufficiently identify the instrument, without setting out any copy or fac-simile, or the value thereof.

In cases of murder and manslaughter it is necessary to describe the manner and means by which the death of the deceased was caused, and any mistake in such description would be a fatal variance between the indictment and the evidence. The remedy suggested is, that it would be sufficient in an indictment for murder to charge that the defendant did "feloniously, willfully, and of his malice aforethought kill and murder" the deceased; and in an indictment for manslaughter, that the defendant did "kill and slay" the deceased. This would be sufficient, in either of these cases, to apprise the defendant of the charge against him, and relieve the Government of the risks of failure now incurred in making lengthy and technical description of the manner and means by which the death was caused.

Where stolen property is found in the possession of a person immediately after it has been stolen, the presumption is that the person in whose possession the property is found is guilty of the larceny; but this presumption may either be rebutted, or serious doubts raised in the mind of the jury by the testimony of the accused; and while it may be perfectly plain that the defendant came into possession of the property in a way that he must have known it was stolen property, yet if indicted for larceny he could not be convicted. An indictment cannot

now be drawn containing two counts, one for the larceny and the other for receiving stolen goods, knowing them to have been stolen. It is very evident that the passage of a law permitting the Government to join in one indictment the two counts, one for larceny and the other for receiving, and giving the jury, at the trial of the case, the power to acquit the defendant of the one offense and convict him of the other, would afford the much-needed facility for a substantial administration of justice in this respect.

The indictment and trial of accessories before the fact is surrounded with technical embarrassments, whereby punishment is postponed, and an avenue opened for the guilty to escape. The indictment must contain the full and accurate charge against the principal, followed by the technical averments charging the defendant with being an accessory before the fact. It follows as a consequence that the charge against both the principal and accessory must be proved as stated in the indictment, and that the accessory cannot be tried until the principal has been tried and convicted. If the principal has escaped, the trial of the accessory must be postponed or ultimately abandoned, however strong the proof may be of his guilty participation. As both principal and accessory are alike guilty, the present defect in the law should be supplied by permitting the accessory to be indicted, tried, convicted, and punished in all respects as if he were a principal.

After the finding of an indictment by a grand jury, and before the trial, should it appear that there was a single inaccuracy or clerical error either in the spelling of a name or in matters of formal description, it would be a fatal defect which would compel the court to quash the indictment. In that case the prosecuting attorney would have to begin his work anew; and if, in the mean time, the statute of limitations had interposed, the defendant, however guilty, would be set at liberty. Should an inaccuracy, error, or variance appear during the trial, it would result in the acquittal of the defendant. To remedy this great evil, the judges in courts of the United States should, like the judges holding court in the different States, have the power, at any stage in the trial, to correct any such inaccuracy, variance, or error by amending the indictment.

When a prisoner is now brought to the bar of the court to be arraigned, according to the ancient usage, he remains standing while the clerk of the court reads to him the whole of the indictment, whether it consists of one page or one hundred, beginning with the caption and ending with the signature of the district attorney. In cases of treason and others where the punishment is death, it is proper to observe all the forms and solemnities attending such grave charges; but in other cases, to dispense with a formal arraignment would save much valuable time, and be of benefit to the prisoner. Under the directions of the court the substance of the charge laid in the indictment could be stated by the clerk; for instance, the statement by the clerk to the prisoner,

"You are charged in this indictment with the embezzlement of one thousand dollars, the property of the United States," would convey to the mind of the prisoner a clearer idea of the nature of the accusation than he could obtain by listening to the reading of the indictment.

Demurrers and motions to quash are a prolific means for impediments to a proper administration of justice. There seems to be no limit to these, especially motions to quash, which may be made in any number and at any time preceding the rendition of the verdict. Counsel for a defendant may retain within his breast the knowledge of a defect in an indictment, and at the end of a long and expensive trial interpose with his motion to quash. The enactment that "every objection to any indictment for any formal defect apparent on the face thereof shall be taken by demurrer, or on motion to quash such indictment, before the jury shall be sworn, and not afterward," would be of incalculable benefit to the United States, without any disadvantage to the defendant.

Where a defendant is arraigned, and it becomes necessary for him to plead that at another trial he was acquitted or convicted of the same charge, great nicety must be observed in setting out his plea. An enactment that "In any plea of *autrefois acquit* or *autrefois convict*, it shall be sufficient for the defendant to state that he has been lawfully convicted or acquitted, as the case may be, of the offense charged in the indictment," will simplify the plea, and relieve the defendant from all technical embarrassments.

The act of June 8, 1872 (section 819, Revised Statutes), specifies the number of peremptory challenges that shall be allowed. In treason and capital cases defendants are allowed twenty peremptory challenges and the Government five. In felonies, the defendant is allowed ten challenges and the Government three. In all other cases, civil and criminal, the defendant and the Government are each allowed three challenges. By the act of February 22, 1867 (section 838 Revised Statutes, relating to the District of Columbia), in cases where the punishment may be confinement in the penitentiary or District jail, the defendant, on trial in the District of Columbia, is allowed four peremptory challenges. In treason and capital cases, allowing a defendant twenty peremptory challenges and limiting the Government to five, is similar to the legislative enactments in the different States, and is a wise and humane provision in the law. The allowance of ten challenges to a defendant in cases of felonies has given rise to serious doubts and indecisions. As the courts of the United States, outside of the District of Columbia, have no common-law jurisdiction, and as Congress has never defined what offenses are felonies, or what cases are to be considered as within the meaning of this section, the question is still the subject of doubts and discussions, and never has been satisfactorily adjudicated. In the District of Columbia, where all general laws of Congress apply, unless they are otherwise inapplicable, the question is more complicated. In the District of Columbia, for an offense which at

common law was a felony, and which is not by act of Congress made a capital offense, the punishment is necessarily confinement in the penitentiary or District jail; so that when a defendant is charged in the District of Columbia with committing an offense which at common law was a felony, it is an open question whether he is allowed the right which he would seem to possess in other courts of making ten challenges, or under the provisions of the act of February 22, 1867, he is limited to four. But in any event the Government stands in the anomalous position of possessing less right in its courts in the District of Columbia than it possesses in any of its courts elsewhere.

In the absence of any law upon the subject, the manner of conducting the challenges and impanelling juries is wholly in the discretion of the court. It is a general subject of complaint among lawyers who are called into various courts, that the difference which exists in the practice in the several courts, in the matter of peremptory challenges, subjects them not only to great annoyance, but often leaves them in danger of losing the right which the law has granted to the defendant whom they represent. The same complaints are made in reference to challenges for cause. In some of the courts, a juror, when challenged for cause, is interrogated by the judge alone; in others the counsel are permitted to make the examination; while in most of the courts the causes of the challenge must be assigned in writing, and thereby much time is lost in the trial. Another cause for controversy is, when prisoners are jointly indicted, whether they can demand separate trials, and whether when jointly tried each defendant shall have separate peremptory challenges, or they shall all be considered as one person with only the challenges that one person is allowed. All the doubts and difficulties which are here enumerated could easily be obviated by the passage of a law providing a uniform and comprehensive system of challenges.

In the early stages of a case, with the limited testimony then before him, the counsel for the Government is often in doubt whether an offense was actually committed, or that there was only an attempt to commit the offense. If the indictment charges the commission of the offense, the evidence at the trial may fail, and disclose only an attempt, which would entitle the defendant to an acquittal. On the other hand, if the defendant is charged in the indictment with an attempt, and the evidence shows the actual commission of the offense, in cases of felonies, the attempt would merge in the felony, and the defendant would escape; and now that defendants are allowed to testify in their own behalf, where a defendant is indicted for an attempt to commit a felony, it will be a strange omission in the law that will enable him to take the witness stand to swear that he actually committed the offense, and thus escape punishment. An act permitting the defendant to be indicted for the actual commision of the offense, "and at the trial, if the evience shows that there was only an attempt, the jury may find that the defendant is not guilty of the offense charged, but is guilty of an at-

tempt to commit the same," would remove all difficulties that now exist.

Questions frequently arise as to the competency or credibility of witnesses who are entitled, in the event of the conviction of a defendant, to compensation or reward by reason of any loss or damage sustained, or for the arrest or apprehension of the defendant. A law should be passed making all such persons competent witnesses.

With all the caution and care that can be exercised by a watchful court and competent officers, it sometimes happens that there is an error or defect either in the precept issued from the court or in the process issued for the summoning or returning of jurors, or in drawing, summoning, or returning jurors. Such errors or defects can be taken advantage of, even after the trial. Where there has been a fair trial on the merits, before an impartial jury who are otherwise competent, a mere technical error or defect, such as above stated, should not be permitted to be used to set aside the verdict of the jury.

With a view to remedy the several evils, omissions, and defects which have been referred to, and that a plain and concise criminal procedure may be enacted as general laws for the courts of the United States, the following forms have been carefully selected, and are respectfully submitted for adoption:

Every indictment and information shall be deemed and adjugded sufficient and good in law which charges the crime substantially in the language of the act prohibiting the crime, and prescribing the punishment, if any such there be, or so plainly that the nature of the offense charged may be easily understood by the jury.

In any indictment for forgery, uttering, stealing, embezzling, destroying or concealing, or obtaining by false pretenses, any instrument, it shall be sufficient to describe such instrument by any name or designation by which the same may be usually known, or by the purport thereof, without setting out any copy or *fac simile* thereof, or otherwise describing the same, or the value thereof.

In all other cases whatsoever, in which it shall be necessary to make any averment in any indictment or information, as to any instrument, whether the same consists wholly or in part of writing, print, or figures, it shall be sufficient to describe such instrument by any name or designation by which the same may be usually known, or by the purport thereof, and in such manner as to sufficiently identify such instrument, without setting out any copy or *fac simile* of the whole or any part thereof.

In any indictment for murder or manslaughter, it shall not be necessary to set forth the manner in which or the means by which the death of the deceased was caused, but it shall be sufficient in every indictment for murder to charge that the defendant did feloniously, willfully, and of his malice aforethought, kill and murder the deceased; and it shall be sufficient in every indictment for manslaughter to charge that the defendant did kill and slay the deceased.

In every indictment for stealing property, it shall be lawful to add a count for receiving the said property, knowing it to have been stolen; and in any indictment for receiving property, knowing it to have been stolen, it shall be lawful to add a count for stealing said property; and it shall be lawful for the jury trying the same to find a verdict of guilty either of stealing the property or of receiving the same, knowing it to have been stolen; and if such indictment shall have been preferred and found against two or more persons, it shall be lawful for the jury who shall try the same to find all or any of the said persons guilty of either stealing the property or of receiving it, knowing it to have been stolen, or to find one or more of the said persons guilty

of stealing the property, and the other or others of them guilty of receiving it, knowing it to have been stolen.

If any person shall become an accessory before the fact to any offense made a felony by virtue of any act of Congress now in force, or that may be hereafter in force, such person may be indicted, tried, convicted, and punished in all respects as if he were a principal felon.

It shall be lawful for any court, if such court shall see fit so to do, to cause the indictment for any offense, except in cases of treason and where the punishment is death, when any variance or variances shall appear between any matter in writing or in print, produced in evidence, and the recital or setting forth thereof in the indictment whereon the trial is pending, to be forthwith amended in such particular or particulars, by some officer of the court, and after such amendment the trial shall proceed in the same manner in all respects as if no such variance or variances had appeared.

If, on the trial of any indictment or information, except in cases of treason and where the punishment is death, there shall appear to be any variance between the statement of such indictment or information and the evidence offered in proof thereof, in the name of any place mentioned or described in any such indictment or information; or in the name or description of any person or persons or body politic or corporation therein stated, or alleged to be the owner or owners of any property, real or personal, which shall form the subject of any offense charged therein; or the name or description of any person or persons, body politic or corporate therein stated or alleged to be injured or damaged, or intended to be injured or damaged, by the commission of such offense; or in the Christian name or surname, or both Christian and surname, or other description whatsoever of any person or persons whomsoever therein named or described; or in the name or description of any matter or thing whatsoever therein named or described; or in the ownership of any property named or described therein; it shall and may be lawful for the court before whom the trial shall be had, if it shall consider such variance not material to the merits of the case, and that the defendant cannot be prejudiced thereby in his defense upon such merits, to order such indictment or information to be amended, according to the proof, by some officer of the court, both in that part of the indictment or information wherein said variance occurs, and in every other part of the indictment or information in which it may become necessary to amend; and after such amendment the trial shall proceed in the same manner, in all respects, and with the same consequences, as if no variance had occurred. And every verdict and judgment which shall be given after making such amendment shall be of the same force and effect, in all respects, as if the indictment or information had originally been in the same form in which it was after such amendment was made.

In all cases of treason, and where the punishment is death, the prisoner shall be arraigned. In all other cases no formal arraignment or reading of the indictment or information to the prisoner shall be necessary; but it shall be sufficient to state to the prisoner the substance of the charge laid in the indictment, under the direction of the court. Where any person on being so arraigned shall plead not guilty, every such person shall be deemed and taken to put himself upon the inquest or country for trial, without any question being asked of him how he will be tried, and the inquest shall be charged only to inquire whether he be guilty or not guilty of the crime charged against him, and no more. If any prisoner shall, upon his arraignment for any offense with which he is indicted, stand mute, or not answer directly, or shall peremptorily challenge above the number of persons summoned as jurors for his trial to which he is by law entitled, the plea of not guilty shall be entered for him on the record, the supernumerary challenges shall be disregarded, and the trial shall proceed in the same manner as if he had pleaded not guilty, and for his trial had put himself upon the country.

Every objection to any indictment or information for any formal defect, apparent on the face thereof, shall be taken by demurrer, or on motion to quash such indict-

ment or information, before the jury shall be sworn, and not afterward; and every court, before whom any such objection shall be taken for any formal defect, may, if it be thought necessary, cause the indictment or information to be forthwith amended in such particular, by the clerk or other officer of the court, and thereupon the trial shall proceed as if no such defect appeared.

In any plea of *autrefois acquit*, or *autrefois convict*, it shall be sufficient for any defendant to state that he has been lawfully acquitted or convicted, as the case may be, of the offense charged in the indictment or information.

On the trial of any indictment for treason or other capital case, the accused shall have the right to challenge, peremptorily, twenty of the jurors, and the Government shall have the right to challenge, peremptorily, five of the jurors. The challenges shall be so arranged, under the direction of the court, that the defendant shall have the right to make the last challenge; and every peremptory challenge beyond the number allowed by law shall be entirely void, and the trial shall proceed as if no such challenge had been made. The jury-box shall be filled before either party shall be called upon to exercise the right to challenge, and, after all the challenges have been made, the jurors shall be sworn to try the indictment.

On the trial of all indictments or informations, except for treason or other capital cases, the Government shall be at liberty to challenge, peremptorily, four of the jurors, and the accused shall be at liberty to challenge, peremptorily, four of the jurors; and every peremptory challenge beyond the number allowed by law shall be void and disregarded by the court. The peremptory challenges shall be conducted as follows, to wit: When twelve jurors have been called and have taken their seats in the jury-box, the Government shall challenge one person, and another juror shall be called and seated in the jury-box in the place of the person so challenged, then the defendant shall challenge one person, and another juror shall be called and seated in the jury-box in the place of the person so challenged, and so, alternately, until all the challenges shall be made; but if either party shall refuse to make a challenge when in turn entitled to make one, such party shall be deemed to have waived their right in that one instance; and if either party shall refuse to make any challenge, the other party shall, nevertheless, have the right to challenge the full number allowed by law. After all the challenges shall have been made, the jurors shall be sworn to try the indictment or information.

Challenges for cause may be made at any time before the jurors are sworn to try the indictment or information. The cause shall be assigned orally, and the truth of such cause shall be inquired of and determined by the court; but the counsel for the Government and the counsel for the accused shall each have the right to interrogate the person so challenged concerning his qualification to serve as a juror.

In all cases in which two or more persons are jointly indicted for any offense, it shall be in the discretion of the court to try them jointly or severally, except that in cases of treason and where the punishment is death, the parties charged shall have the right to demand separate trials; and in all cases of joint trials the accused shall be considered as one person, and shall have the right to the number of peremptory challenges to which one would be entitled if separately tried, and no more.

If on the trial of any indictment or information, except for treason and where the punishment is death, it shall appear to the jury upon the evidence that the defendant did not complete the offense charged, but was guilty only of an attempt to commit the same, such person shall not by reason thereof be entitled to be acquitted, but the jury shall be at liberty to return, as their verdict, that the defendant is not guilty of the offense charged, but is guilty of an attempt to commit the same; and thereupon such person shall be liable to be punished in the same manner as if he had been convicted of the particular offense charged in the indictment or information; and no person so tried as herein lastly mentioned shall be liable to be afterward prosecuted for an attempt to commit the offense for which he was so tried.

No person shall be deemed and adjudged an incompetent witness on the trial of any indictment or information, for or by reason of such person being entitled, in the event

of the conviction of the defendant, to a restitution of his property taken, or the value thereof, or, if fraudulently obtained, to a pecuniary remuneration or compensation therefor, or, to a remuneration or reward for the arrest or apprehension of the defendant.

No verdict in any criminal court shall be set aside, nor shall any judgment be arrested or reversed, nor sentence delayed, for any defect or error in the precept issued from any court, or in the venire issued for the summoning and returning of jurors, or for any defect or error in drawing, summoning, or returning any juror, or panel of jurors; but a trial, or an agreement to try on the merits, or pleading guilty, or the general issue in any case, shall be a waiver of all errors and defects in, or relative or appertaining to the said precept, venire, drawing, summoning, and returning of jurors.

In England and in most of the States, laws similar to the ones above suggested have been adopted, and after being in force for more than a quarter of a century are commended by the bench and the bar as valuable aids in securing a fair and impartial administration of justice.

PERJURY.

The Treasury Department seems to have been well protected by laws designed to prevent and punish the use of false affidavits concerning the business in that Department. But the other Departments of the Government, particularly the Post-Office Department, have not been so fortunate. By act of Congress the head of each Department is allowed to prescribe rules and regulations for the conduct and management of the business of his Department. Under this authority rules and regulations have been prescribed in each of the Departments, and these rules and regulations have the full force and effect of laws. The Postmaster-General, when called upon to exercise a discretion in diminishing or increasing the service and prescribing the pay to be allowed to the contractor for such increase or diminution, is compelled to rely mainly upon the statements of the contractor, made under oath, to guide him in this respect. An affidavit may now be furnished to the Postmaster-General false in every particular, and upon the strength of which oath the Postmaster-General may make an order whereby the Government may be defrauded of a large amount of money, yet it is doubtful whether the person making such false oath commits any offense against the present laws of the United States. In order that there may be no doubt upon this subject, and to provide a sufficient protection for the Post-Office and all other Departments in this regard, and to extend the offense of perjury to false evidence given before any commission or commissioner, it is respectfully suggested that section 5392 of the Revised Statutes of the United States should be amended so as to read (the parts supplied being in brackets):

SEC. 5392. Every person who, having taken an oath before a competent tribunal [commission, commissioner], officer, or person, in any case in which a law of the United States [or any rule or regulation prescribed by the head of any Department of the Government of the United States] authorizes an oath to be administered, that he will testify, declare, depose, or certify truly, or that any written testimony, declaration, deposition, or certificate by him subscribed is true, willfully and contrary to such oath

states or subscribes any material matter which he does not believe to be true, is guilty of perjury, and shall be punished by a fine of not more than two thousand dollars, and by imprisonment at hard labor not more than five years; and shall, moreover, thereafter be incapable of giving testimony in any court of the United States until such time as the judgment against him is reversed.

CODE OF LAWS FOR THE DISTRICT OF COLUMBIA.

The laws for the prevention and punishment of crimes and regulating civil matters in the District of Columbia are supplied from different sources. All of the general laws of Congress, not otherwise inapplicable, are in force in the District. Congress has from time to time passed special laws relating to the District of Columbia, and also, by the act of February 22, 1801 (section 92 of the Revised Statutes, relating to the District of Columbia), the laws of the State of Maryland, as the same existed on the 27th day of February, 1801, except as since modified or repeaied by Congress, continue in force within the District. In addition, the Territorial legislature, while it existed, passed some laws, and the levy court and the councils in Washington and Georgetown have each contributed in this direction.

In passing general laws Congress has depended upon the local State laws to supply deficiencies that would otherwise have been provided for. In passing special laws for the District of Columbia much dependence has been placed upon the laws of Maryland to provide a proper criminal code for the District. Where Congress has failed to define or provide a punishment for what should be a crime in the District recourse is mainly had to the laws of Maryland, and as most of the laws of Maryland that existed prior to February 27, 1801, have since been repealed, altered, or amended, the former laws have long ceased to be known or considered by the present generation of lawyers. The consequence arising from the confusion now existing is, that what laws are in force in the District of Columbia is a matter involved in such obscurity and doubt, that it remains a legal puzzle upon the solution of which no two lawyers can agree. A number of attempts have heretofore been made to secure the adoption by Congress of a general code of laws for the District, but the efforts have failed. On December 4, 1879, a letter was forwarded to the Senate by the Commissioners of the District at the second session of the Forty-sixth Congress recommending the adoption of a code which accompanied the letter. It was referred to the Committee on the District of Columbia, but was never adopted. Then, on the 11th of January, 1881, an act was introduced in the House of Representatives, at the third session of the Forty-sixth Congress, which was reported to the House, but failed in its passage. Again, on the 11th of January, 1882, another bill to establish a municipal code for the District was introduced at the first session of the Forty-seventh Congress. This last bill passed the House of Representatives, was sent to the Senate, and there failed in its passage. In view of the facts

above stated there seems to be an imperative necessity for the prompt adoption of a civil and criminal code for the District of Columbia.

JURIES IN THE DISTRICT OF COLUMBIA.

The evils that surround the jury system in the District of Columbia demand condemnation. By act of June 30, 1879, chapter 49 (Supplement, page 497), Congress provided a mode of selecting and drawing jurors, which no doubt was intended to apply to all courts in the United States; but it has been decided, and properly too, that the act does not apply to the District of Columbia. The laws which are now supposed to be in force in the District regulating the selecting, drawing, and summoning of jurors have been passed in the years 1838, 1862, 1865, and 1871, and are found in sections 851 to 875 of the Revised Statutes relating to the District of Columbia. An analysis of the system there provided will demonstrate its many defects: "The supreme court of the District may, by orders in general term, from time to time, designate necessary officers or persons to make the list of jurors." This is a commendable feature, as it secures that faithful and conscientious exercise of a discretion which courts always exercise, and the appointment of honest and competent persons. In January of each year five citizens are designated by the court, who are called jury commissioners.

That the duties to be performed by the persons so designated are onerous and unsatisfactory is no fault of theirs. The law requires them to make a list of jurors from the names of citizens and residents of the District, who are competent, and who are not by law exempt from jury duty, and prescribes that, "No person shall be competent to act as a juror unless he is a citizen of the United States and resident of the District, over twenty-one and under sixty-five years of age, and a good and lawful man, who has never been convicted of a felony or other misdemeanor involving moral turpitude." Those exempt from jury duty are people whose names have been drawn from the box within the preceding two years, and officers and persons in the employ of the Government of the United States, commissioners of police, those connected with the police and fire departments, counsellors and attorneys at law, ministers of the gospel, priests of every denomination, practicing physicians and surgeons, keepers of hospitals, asylums, almshouses, and other charitable institutions, captains, masters, and persons employed on vessels, and keepers of public ferries. Besides, there are a large number of people who carry on business, or who own or rent houses and live with their families during the greater part of the year in the District, and yet claim a home and citizenship elsewhere. To become a citizen of the District is to lose the right to vote in any other place, and this matter of temporary residence is so well understood, that the question asked by one acquaintance casually meeting another in the streets or houses in Washington is not "Where do you reside?" but invariably, "Where are you stopping?" This large class of intelligent

and desirable residents, unfortunately, are also exempt from jury duty. In the District there is no official list, or list of voters, or assessors' list of taxable inhabitants, such as is found elsewhere, and the jury commissioners are therefore compelled to depend upon their own knowledge, or in whatever other way they may find it to be possible to obtain the necessary information. After selecting the five hundred and twenty names required (in the absence of any law upon the subject) in the month of February in each year, the names are copied on separate slips of paper, which are rolled up, placed in the jury-box, the box is sealed, shaken up, and given into the custody of the clerk of the court.

The judges of the supreme court of the District are required to assign one of their number to hold the criminal court during the ensuing year, beginning in the month of March, and as there are seven judges upon the bench in the supreme court, each of the judges should be assigned to hold a criminal court only once in seven years, unless, in rare instances, where there is a press of business, a judge may be assigned to hold a special court. There are three terms in the criminal court, beginning, respectively, on the first Monday of March, the third Monday of June, and the first Monday of December in each year.

By one provision in the law, at least ten days before the commencement of each term the clerk "shall publicly break the seal of the jury-box, and proceed to draw therefrom the names of so many persons as are required," but where, in whose presence, or under whose directions this important public duty is to be performed is not specified in the law, and the clerk draws the jury in his office.

By another provision, "if any person whose name is drawn shall have died or removed from the District or become otherwise disabled from serving as a juror, the clerk shall draw from the box another name to serve instead," a positive command is given the clerk, coupled with judicial power in its execution. When it is remembered that the clerk does not know what names are in the box, or which of them he is going to draw out, that the 520 names are selected from a population of over 180,000, and the improbability of the clerk having any personal knowledge of the death, removal, or disability of the persons whose names he draws, and his inability to cease drawing in order to make inquiries, it will be perceived that the law imposes upon the clerk a duty which it is impossible for him to perform, which he is compelled to disregard, and, by so disregarding it, raises a doubt as to the regularity of his proceedings.

The method of drawing jurors for the civil and criminal courts is the same. If the jury is intended for service in the criminal court, the twenty-three persons whose names are first drawn constitute the grand jury and the twenty-six persons whose names are next drawn constitute the petit jury for that term. After the requisite number of jurors have been drawn the box is again sealed, and remains in the custody of the clerk. The jurors are summoned by the marshal, who is required to

make a return to the court of the names of the persons summoned, how the summons was served, with a copy of the summons served upon each person. Whether any neglect or omission on the part of the marshal in performing his duties would be a fatal defect would depend upon the nature of such neglect or omission.

On the first day of the term it is usually found that about two-thirds of each set of jurors answer to their names, the marshal having been unable to find the other one-third. The first business in order is for the court to hear the various excuses offered by the jurors who have been summoned and who desire to be relieved from duty. At this point it is proper to direct attention to the extraordinary fact, that service as a juror in the District means an enforced attendance at court and almost total abandonment of private business for one-fourth of the whole year, a hardship and injustice that is not imposed upon citizens in any other place in the United States, and would not be tolerated in any community where the people have a voice in framing their own laws. By one of the sections in the law, "a person may be excused by the court from serving on a jury when, for any reason, his interests or those of the public will be materially injured by his attendance, or where his own health or the death or sickness of a member of his family requires his absence." Continuous absence and neglect of business for three months in the year would materially injure the interests of any business man, and a respectable physician would readily certify that attendance for that length of time in a crowded court-room would be injurious to the health, so that the court is reluctantly compelled to excuse from service the very men who, of all others, are best qualified to intelligently aid and assist in the administration of justice. Added to those who are thus excused, there are always found among the jurors several who, although their names were placed in the jury-box, and they have responded to the summons, are in public employment and therefore exempt.

When the court has passed upon the various claims to be excused and exempted there will remain probably one-half of the number of jurors required by law, and before proceeding with the trials of cases the attendance of the full number must be secured. The way in which the required number is to be selected is not clearly defined by the law, which is interpreted by each judge according to his own view. Some of the judges cause the jury-box to be again opened and the requisite number of names drawn out; others direct the marshal to summon talesmen; but both ways have been held to be proper. In selecting talesmen the marshal may summon a man or men from among the bystanders in the court, persons passing along the public streets, or from any of the stores, banks, counting-houses, offices, hotels, or residences in the city. In selecting talesmen another great hardship is imposed upon the person so summoned. When a name is drawn from the jury-box in the first instance the person whose name is so drawn receives a reasonable notice that his services will be required, and is thus enabled

to arrange his business that it may not suffer by his absence; but to suddenly and unceremoniously take a man from his residence, or off the street, a merchant from his store, or a clerk or book-keeper from his bank or counting-house, is an arbitrary act of injustice, which, although practiced at the beginning of the present century, is totally inexcusable at this time; and it is very doubtful whether a person so summoned, if compelled to serve, has his mind sufficiently free from care and anxiety about his own business to intelligently adjust and decide the differences existing in the affairs of others. When the additional jurors appear in court their excuses are also heard, and, if any are excused, others are summoned in their place, and so on, until, after the expiration of from one to three days, and in some instances even longer, the court has secured twenty-three grand jurors and twenty-six petit jurors who are either willing to serve or have failed to show a sufficient cause to be excused.

If the method adopted for selecting and procuring a jury is primitive, inefficient, and censurable, the result attained by that method cannot be sufficiently condemned. In most of the courts in the United States, according to the character and gravity of the cases to be tried, from forty-eight to sixty jurors are summoned, who serve for two or three weeks. It is doubtful if there can be found in any of the States a county where at least thirty-six jurors are not summoned to try the petty police and quarter-sessions cases, and for the higher courts and the trial of the higher grades of offenses from sixty to eighty jurors. But in the District of Columbia, with its large and rapidly increasing population, with the abundance of wealth and the extreme of poverty, with all the inducements and opportunities for the commission of crimes, there is not one of these crimes, from the highest to the lowest, if tried at all, that must not be tried before the miniature jury of twenty-six persons. When the dock is filled with prisoners waiting to be tried, if one case is called, tried, and the jury retire to deliberate, and another case is called, the jury placed in the jury-box, and the prisoner exercises three out of his four peremptory challenges, the court is left without a jury. In this dilemma the trial must stop, the business is suspended until the absent jury returns into court, or, as is usually done, the court will order the marshal to summon more talesmen to serve in that one case. If two juries are deliberating at the same time the court must take a recess.

In murder and other capital cases, the prisoner is allowed twenty peremptory challenges, leaving only six of the original jurors to serve, so that after the fourteenth, if the prisoner makes another challenge, the box must be opened, a new name drawn out, the person summoned, and his excuses heard; if he is excused, then another name is drawn, that person is summoned, and his excuses heard. The same course is pursued when every other of the remaining challenges is made, and in this way the selection of a jury becomes a business of almost intermina-

ble length, and a source of annoyance and inconvenience to all who may be called upon to take any part in it.

It is the subject of belief and common report that the business of "jury fixing" flourishes to an alarming extent in the District. It is asserted that men live, support their families, and even become rich in the practice of this nefarious profession. Such a practice or profession exists to some extent in nearly every large city, under the best devised jury systems, and notwithstanding the care, attention, and safeguards thrown around the juries to prevent their being tampered with. But, as the jury system now exists, that unscrupulous men should safely conduct a lucrative business in debauching juries in the District should occasion no surprise. With but twenty-six jurors such as usually serve, an active jury fixer would become acquainted with at least two or three of them in a few hours, and that would give him a strong beginning in his efforts to thwart justice. With but twenty-six jurors, serving for three months, it would not require one-third of that time for the combined force of jury fixers to become thoroughly acquainted with the habits, associations, character, and business of each juror, and the influences, if any, that could be used to reach him and bring him within their power. Then again, what is there to prevent one or more well-dressed and apparently respectable looking rogues placing themselves in the way of the marshal or his deputies, to be brought into court as talesmen, and serving upon the juries to acquit their friends or confederates? Such devices unhappily are not unknown in the District, and others could be enumerated, and will naturally suggest themselves, after a careful consideration, but enough has been shown to demonstrate the fact that unnecessary responsibility is placed upon officers who, although acting from the purest and most conscientious motives, are liable at any time to censure and reproach, and that the court and prosecuting officer should not any longer be compelled to struggle with the limited machinery placed at their disposal. It is recommended, in the interest of justice and as a matter of economy, that the number of jurors should be increased to forty-eight, that the time of service should be reduced to one month, that where a deficiency exists in the jury, that deficiency should be supplied from the box, and that an improved system of drawing, selecting, and summoning juries should be adopted without delay.

SPECIAL JURORS IN THE DISTRICT OF COLUMBIA.

Independent of those crimes committed in the District of Columbia, which are for offenses affecting the citizens of the District alone, there are others of a public character which are against the whole people of the United States. A broad line of distinction must be drawn between these two classes. The National Government is in Washington, with the Treasury and the other Departments, and the numerous officers there employed in the conduct and management of public

business. Temptations are frequently offered, and plots devised to corrupt these officials, and the efforts are sometimes successful. In the past six years five or six of the officials here employed have betrayed the trust imposed in them, a fact which in itself is the highest compliment which could be paid to the great number who have been found faithful. In every case where a Government official has committed a crime against the Government he has been prosecuted with determined vigor. When the crime has been committed and tried outside of the District, justice has been accorded the Government; but when the crime has been committed and tried within the District, justice has too frequently been denied the Government. A person in the employ of the Government who betrays his public trust commits a crime against the United States. When that crime is perpetrated within the District, past experience proves that he should be tried before a jury other than that engaged in the trial of the local crimes committed in the District.

The national Treasury is the great center of allurement and temptation. Inroads are made upon it through all avenues by which it can be approached. Every device which human ingenuity can contrive is resorted to, and perjury, forgery, and all crimes necessury are unhesitatingly committed to reach the treasure and despoil the public money. The constant zeal and care of experienced Government officials, in every Department, are required to prevent these vile plans being carried out. The effort on one side is to steal the money of the people, on the other to prevent it; but with all the care and attention which honest and competent public servants can exert, bad men are sometimes successful. Laws have been passed by Congress broad enough to make every fraud or attempted fraud upon the Government a crime to be severely punished. The one great difficulty now encountered is the want of a proper jury system with which to enforce these laws.

All plans to defraud the Government, or to steal from the public Treasury, no matter where contrived, are mostly consummated in Washington, and when the guilty parties are arrested their trial must of necessity take place before a jury drawn in the District. The arrest of one set of defendants brings to them the sympathy and active aid of all others who are engaged in similar schemes. If the defendants are wealthy, as is often the case, by a liberal expenditure of money they secure the acquaintance and friendship of prominent men who are of a social disposition, and whose open and public association and companionship with the defendants is not without its helpful effect. When the case is called for trial the Government stands alone, and opposed by many disadvantages, while the defendants, aided not only by their wealth, the encouragement and influence of their friends, but by a certain feeling of indifference which seems to prevail in Washington concerning such crimes, are permitted to depart from the court-room triumphing in their acquittal, escaping punishment and scandalizing

the administration of justice. Such has been the case before, and such will occur again, so long as the National Treasury is confided solely to the protection of local juries.

It is not easy to determine what method to adopt for the trial of these public cases, as any change will be objected to because it may increase expense. Change of venue and special or struck juries have been adopted elsewhere, to secure protection from a failure of justice because of the defects of local juries, and both methods, wherever existing, are commended. It is of the utmost importance that either or both methods should prevail in the District.

If a change of venue could be accomplished by certifying the indictment and proceedings for trial in such other judicial district where the greatest number of witnesses reside, or where, in the discretion of the court, a trial may be had with the least inconvenience and expense to the Government and the defendants, some relief would be afforded.

It may be objected that such a remedy is beyond the constitutional power of Congress, but as the offenses in question are not committed within any State, the trial may be at such place or places as Congress may by law direct (Art. 3, sec. 2, par. 3), and this apparently is not affected by the sixth amendment (United States *vs.* Dawson, 15 How., 467).

Congress has exercised this power when deemed expedient (Statutes, 1834, ch. 161; 1844, ch. 103; 1868, ch. 273), and with the highest judicial sanction, as is shown by the authority last cited.

How far Congress may go in such legislation it is needless to discuss here. If in its judgment the due administration of justice in such cases requires a modification of the present system of trial, its wisdom will devise a sufficient remedy. It may nevertheless be of service to suggest that a method analogous to those pursued in the legislative precedents mentioned would perhaps be most approved, and this is in substance, by annexation or otherwise, to invest the nearest adjacent competent tribunal with jurisdiction.

I submit that the desired end might be attained by extending (in such form and under such limitations as may be advisable) the jurisdiction of the United States circuit and district courts for the judicial district of Maryland, so as to include the cognizance of crimes committed in the District of Columbia. By this the circuit and district courts of that judicial district would have original jurisdiction over all crimes committed in the District of Columbia which are offenses against the general laws of the United States, and their jurisdiction would be concurrent with that of the courts in the District of Columbia, so that the prosecutions and trials could be proceeded with in either courts. The advantages to be derived are, that where the trials take place in the circuit or district court in Maryland, the jury would be drawn in the manner now prescribed by law, from the people of the entire State of Maryland, and the chances of obtaining an impartial jury would be greatly increased.

The details are as follows:

The original jurisdiction of the circuit and district courts of the United States in and for the judicial district of Maryland is hereby extended and enlarged, so that the same shall extend to and include all offenses against the general laws of the United States committed in the District of Columbia. And whenever any offense shall have been committed in the District of Columbia which if committed in the State of Maryland would be triable in the circuit court of the United States in and for the judicial district of Maryland, the defendant or defendants may be indicted, tried, convicted, and sentenced in the circuit court of the United States in and for the judicial district of Maryland. And whenever any offense shall have been committed in the District of Columbia which if committed in the State of Maryland would be triable in the district court of the United States for the judicial district of Maryland, the defendant or defendants may be indicted, tried, convicted, and sentenced in the district court of the United States for the judicial district of Maryland: *Provided*, That nothing herein contained shall deprive the supreme court of the District of Columbia, or other courts of the District of Columbia, of jurisdiction for the trial of offenses against the United States committed in the District of Columbia: *And provided further*, That, for the sole purpose of carrying this act into effect, the District of Columbia be, and the same is hereby, included within the judicial district of Maryland.

Indictments and informations may be removed from the courts of the District of Columbia for trial in the circuit court of the United States or in the district court of the United States in and for the judicial district of Maryland, in whichever of the said courts the offense charged in the indictment or information may by law be triable. Whenever an indictment shall have been found or information filed in any of the courts of the District of Columbia, charging any person or persons with the commission of an offense which by law is triable in the circuit court or the district court of the United States in and for the judicial district of Maryland, and the Attorney-General of the United States, before the first or any subsequent trial thereof, shall certify that the interests of justice require that the indictment or information shall be removed from the supreme court of the District of Columbia to the circuit court of the United States (if the offense charged in the indictment is by law triable in the said circuit court), or to the district court of the United States (if the offense is by law triable in the said district court), as the case may be, and the justice holding the criminal term of the supreme court of the District of Columbia or other court shall be satisfied that the offense charged in the indictment or information is a violation of one of the general laws of the United States, the justice shall make an order that the record and the indictment or information and all proceedings thereunder shall be certified to the circuit court of the United States for the judicial district of Maryland (if the offense charged in the indictment is by law triable in the said circuit court), or to the district court of the United States for the judicial district of Maryland (if the offense charged in the indictment is by law triable in the said district court), as the case may be, for trial. And every indictment or information so certified to the said circuit court or to the said district court shall be proceeded with to trial, conviction, and sentence in the same manner and to the same effect as if the prosecution had been commenced and the indictment or information had been criminally found by the grand jury in the court to which the indictment or information shall be certified.

THE JAIL AT FORT SMITH, ARK.

The district court at Fort Smith, Ark., has criminal jurisdiction over a portion of the Indian Territory. A large number of prisoners is therefore necessarily held at that place. As the county has no jail, they are confined in the basement of the abandoned Army barracks now used for court purposes. Officers of this Department who have visited Fort

Smith, and the United States marshal for the western district of Arkansas, report that the two rooms, which are constantly crowded with from 75 to 150 prisoners, are totally unfit for use as a jail, being damp and unhealthy. Permanent diseases are contracted, and the report of the Detroit house of correction, where prisoners sentenced in the western district of Arkansas are confined, shows that a large number of the deaths in that institution is made up of convicts who were confined in the Fort Smith jail previous to their trial and sentence. Although a physician is in constant attendance, prisoners who have entered this jail in apparent good health have, after a few months' confinement, been released almost physical wrecks. Besides this, as there are but two large rooms in which to confine the prisoners, nothing separates the outlaw and murderer from the detained witness. Young and old, innocent and guilty, are all crowded together.

I submit herewith, marked Exhibit Q, a letter from Marshal Boles, describing in detail the construction of this jail.

Humanity demands that this state of affairs be remedied. The county will probably not erect a jail for several years, and I earnestly repeat the recommendation in my former report, that Congress make provision for the building of a suitable jail by the Government at Fort Smith. This can be done at small cost by the use of the prisoners' labor and the old material now on the abandoned military reservation at that point.

JAIL, DISTRICT OF COLUMBIA.

As stated in my last annual report, there is no one person responsible for the entire management of the jail in the District of Columbia. It is therefore impossible to obtain the satisfactory results desired. It is believed that it could be conducted with greater economy to the United States and greater benefit to the community if placed directly under the management of the Attorney-General, who is responsible for its expenses, as charges are sometimes presented which he thinks ought not to be incurred. To remedy this, it is necessary that the whole management—the warden, the guards, and every laborer connected with it—be placed under the control of the Department which bears the expenses, and to which they ought to be made personally responsible for the proper discharge of their duties. As far as possible careful attention has been paid by this Department to the expenses of the jail during the past year, and there has been a reduction in those expenses of $8,574.70 during the fiscal year 1884. It is to be considered whether better results might not be obtained if the entire management was placed directly under the control of the Attorney-General.

Exhibit S is the report of the warden and other officers of the jail for the past year.

REFORM SCHOOL, DISTRICT OF COLUMBIA.

Your attention is invited to the report of the Reform School of the District of Columbia.

Upon favorable reports of officers of the Department of Justice as to the management of this institution, I desired to designate it as the place of confinement for juvenile offenders from convenient districts; but the law governing the admission of this class of offenders seemed to prevent this, and the president of the board of trustees has called attention to the matter in his report. It is to be hoped that this may be remedied, so that the designation above suggested can be made.

Exhibit R is the statement of the president, superintendent, physician, and treasurer. The expenses of the last fiscal year are therein detailed, and the views of the officers presented as to improvements necessary to meet the demands of the school.

As heretofore, I again commend the interests of this important institution to the consideration of Congress.

INSANE CONVICTS.

By the act of June 23, 1874, the Attorney-General was authorized to contract with State asylums for the care and custody of any person who should become and be insane while under the sentence of a United States court. The law upon this subject is too restricted to allow those provisions for the insane which humanity requires. The contract and payment for such care beyond the term of imprisonment is not provided for, and on this account local institutions decline to receive prisoners who were convicted in another State than that wherein such institution is situated. Additional legislation is required to enable the Attorney-General to return such prisoners, after the expiration of their sentences, to their friends or the place of conviction, and to properly compensate State asylums until this can be done. Sometimes such prisoners are utterly friendless, and authority should be given to the Attorney-General to take proper care of them until they can be provided for by humane persons or by some public institution.

By the act of Congress of August 7, 1882, upon application of the Attorney-General, the Secretary of the Interior was authorized and "directed" to transfer to the Government Hospital for the Insane, in the District of Columbia, all persons who were charged with offenses against the United States, and were in the actual custody of its officers, who had during the time of their imprisonment become and were insane, as then appeared. By the appropriation for the Government Hospital for the Insane no provision was made for the transfer by the Secretary of the Interior of these prisoners to the hospital. It became the duty of the Attorney-General, during the last two years, to transfer certain insane prisoners. The Secretary of the Interior declined to incur the expense of the transfer, as it was not provided for in that special appropriation. These expenses have been incurred, by and with the consent of the accounting officers of the Treasury, by the Attorney-General, through the United States marshals. If the Secretary of the Interior

is to execute the law as it now stands, he should be furnished with funds for the transfer. The defect in the law should be remedied.

PENITENTIARY, MONTANA TERRITORY.

In the Book of Estimates of the expenses of the United States courts for the fiscal year ending June 30, 1886, are several estimates for the enlargement, construction, and repairs of the penitentiaries in the Territories of Montana and Utah, and the construction of a United States jail at Fort Smith, Ark.

The appropriation of $15,000 for the enlargement of the penitentiary for Montana Territory, act of July 7, 1884 (Statutes at Large, Vol. 23, p. 126), was placed by Congress under the control of the Secretary of the Treasury, and therefore no statement can be made by this Department as to the application of the funds appropriated or progress made in the enlargement proposed. The necessities of this penitentiary are great. The building is crowded, with Territorial prisoners for the most part, beyond its extended capacity, which was reached in September, 1884, when arrangements were made by the Territory for the imprisonment of persons convicted after that date in other places of confinement, the penitentiary being unable to receive any more convicts. The appropriation of $15,000 is inadequate. A further appropriation of $15,000, at least, should be made. The penitentiary at present is insecure, and is more or less unhealthy and expensive. Its crowded condition is an incentive to jail-breaking and to almost hourly efforts of escape on the part of the inmates.

Letters from Governor Crosby and Marshal Botkin, concerning the penitentiary, are attached hereto, marked Exhibit U.

PENITENTIARY, UTAH TERRITORY.

An estimate of $55,000 has been submitted for the construction of a penitentiary on a Government reservation near Salt Lake City.

The present building is an adobe structure. Its walls can be penetrated by a common pocket knife, and could easily be thrown down by the prisoners were no other means taken to secure them. On the inside of the walls there are buildings for their confinement. The prisoners in this penitentiary are for the most part made up of convicts who have violated the Territorial laws of Utah, and cost the Government about $18,000 a year. Much of this expense will be avoided if the buildings be made secure. It was with the view of avoiding this great expense in the future and of keeping the prisoners securely that the estimate for the construction of a penitentiary in 1886 was placed at $50,000.

Attached hereto is a letter from E. A. Ireland, United States Marshal of Utah, marked Exhibit T.

UNITED STATES PRISONERS.

During the past year the usual examinations have been made of the several penitentiaries where United States prisoners are confined. In caring for these prisoners I have been impressed with the want of a penitentiary centrally located and controlled by the United States. The Government prisoners generally are confined in State and municipal institutions, over which the Department has no direct control. It is therefore not always possible to secure such treatment and discipline for the prisoners as would be best calculated to effect their reformation. Many of the State penitentiaries are well conducted, and pains have been taken to select such places, but at any time, through a change in the officers, or some other cause, the management of a penitentiary in which there is a number of United States prisoners may change for the worse, and in such a case there is no remedy but the costly one of removing all the prisoners to another place of confinement, which in time may become even worse than the former. And even this power to transfer has restrictions which sometimes render it inadequate to meet the case. After careful consideration, I am satisfied that eventually the Government should erect and control a penitentiary in which to confine its own prisoners. It would be better both for society and the prisoners themselves.

At present, by reason of favorable contracts which have been secured, the cost of maintaining the United States prisoners in the penitentiaries has been reduced to a nominal sum, and I do not overlook the fact that the erection of a Government penitentiary, as is suggested, would increase considerably the expense of keeping these prisoners above what it now costs under these contracts, but I believe that the benefits would more than compensate for the outlay. The subject of convict labor is now receiving the attention of the people and legislatures of the several States. Eventually it may affect the contracts heretofore mentioned, and the cost of supporting United States prisoners would be advanced to its former large proportions, which probably would exceed the cost of erecting and maintaining a Government penitentiary.

United States prisoners as a rule are of a better class of men than the average convict, and are capable of performing better work. If a Government prison were erected the convicts could be employed in the manufacture of supplies exclusively for the Government. This would keep them employed, and should render the penitentiary almost self-sustaining. It would also avoid any objection to convict labor, while the tax-payers would be relieved almost entirely of the burden of supporting them. There are now about 1,200 United States prisoners under sentences of one year and over.

One thousand of these are in prisons east of the Mississippi River, and if Congress acts upon this recommendation, it is suggested that the penitentiary should be erected at some central point where there

are ample railroad facilities for the transportation of the prisoners and the goods manufactured by them.

United States prisoners as a class are not professional criminals, and it is often desirable to have such men sentenced to reformatories, as is the practice in some of the States, notably New York, and for indeterminate sentences, the imprisonment to be lengthened or shortened by their conduct. As the law now stands, United States judges cannot impose sentences of this character, and hence the Government cannot avail itself of the use of these institutions. I, therefore, earnestly repeat the recommendation made in my last annual report, that authority be given the judges of the United States to sentence in their discretion prisoners convicted of first offenses to such reformatories or graded prisons as the Attorney-General may select, upon the terms and conditions which govern those institutions in the case of prisoners convicted under the laws of the place in which the institution is located; and it is especially recommended that such a law be passed in regard to the sentencing of juvenile offenders.

United States prisoners awaiting trial or sentence, and those undergoing terms of imprisonment of less than one year, are confined in the various county jails. Efforts have been made to secure their proper treatment as far as possible, and economical arrangements have been entered into for their maintenance and medical treatment, by which the expense of supporting this class of prisoners has been reduced.

ORIGINAL RECORDS OF THE ATTORNEY-GENERAL'S OFFICE.

It is recommended to Congress that the Attorney-General be authorized to take proper steps to secure and to preserve the records of the office of the Attorney-General which accumulated prior to the creation of the Department of Justice, July 1, 1870. They are of a miscellaneous character, and are important, not only as a history of the Department during an interesting period, but they ought to be preserved because of the valuable information they contain concerning public affairs of the United States previous to the date mentioned. They are now without system or order, subject to loss and destruction. They should be collated in order of time, filed, and labeled, so as to be of easy reference in investigations of any matters which happened in past years connected with the Department. At times it is necessary to find facts or records among these papers, which are now without order. If properly arranged this might be done in a few minutes; but now a labor of weeks, and in some instances a month, is required.

In connection with this, I repeat my recommendation that some room or rooms in this building be so prepared as to render them as secure from fire as possible, for the preservation of the records of the Department. There is now nothing more than the ordinary protection for the records, but for their better security some room should be fitted up and provision made by Congress for their arrangement and preservation.

DEPARTMENT BUILDING AND GROUNDS.

Under the act of Congress placing the building of the Department of Justice under the care of the Attorney-General no mention was made of the care of the grounds adjoining the building and purchased at the same time. Expenses have been incurred for taking charge of the same, under the authority of the Attorney-General. It seems proper that, as these grounds are a part of the original purchase, they ought to be placed, together with the building itself, under the exclusive control of the Attorney-General, and thus avoid a divided jurisdiction over the whole property dedicated by law to the use of the Department of Justice.

THE LIBRARY.

A larger annual appropriation than that hitherto made is needed to meet the wants of the library of this Department. To supply deficiencies already existing in treatises on various branches of jurisprudence, in law reports, and in works of reference, and to purchase the numerous books of this character published during the year will require at least $2,500, and I recommend that the annual appropriation for law and miscellaneous books be increased to that amount.

In addition to the $500 appropriated at the last session for the special purpose of supplying deficiencies in sets of State statutes, I recommend a further appropriation of $500 for the same object. Much inconvenience arises from the want of more complete collections of these statutes than are at present found on the shelves of the library.

DISTRIBUTION OF LAWS AND SUPREME COURT REPORTS.

By provision of the sundry civil act of August 7, 1882, an appropriation was made to supply district judges, district attorneys, and clerks of the United States courts, who have not already received the same, with the Revised Statutes, and the statutes annually published since the first revision.

Referring to the act of June 30, 1882, it is deemed advisable to renew a former application for the distribution to district judges and district attorneys of the reports of the Supreme Court of the United States, and for furnishing complete sets of the same where there are none at such points where the United States courts are authorized to be held, and to supply broken sets where there are missing volumes.

The applications of judges and attorneys throughout the country represent an existing necessity for these volumes. It cannot be expected that attorneys, whose terms of office are for a short period, will incur the expense of purchasing these books, which are not necessary in their ordinary practice, but which are essential to enable them to protect the interests of the United States. It is believed that the expenditure of the money necessary to purchase these books would be a wise economy, as it would enable the officers of the United States to

protect the interests of the Government. The rule of the Attorney-General, which requires outgoing officers to turn over to their successors all books in their custody belonging to the United States, and to send to the Department of Justice duplicate receipts therefor, before their accounts will be adjusted, has been found to protect the Government property, including all books in their offices, from loss or destruction.

UNIFORM SYSTEM OF BOOKKEEPING FOR UNITED STATES MARSHALS.

Embraced in the bill providing for salaries for United States court officers, introduced at the last session of Congress, was a clause directing the Attorney-General to provide a uniform system of bookkeeping and returns, and furnish books and blanks for this purpose to United States marshals. Though this bill did not pass, there was an appropriation of $10,000 "for providing a uniform system of bookkeeping for court officials, to be expended under direction of the Attorney-General." Accordingly, I have had a system of bookkeeping carefully prepared, together with blanks and forms incident thereto, which, in my judgment, seems well adapted for the purpose. I have printed proofs of the forms of the different books and blanks, and intend putting the system to a practical test in several districts during the coming winter. If this system proves satisfactory, as I believe it will, the books can be bound and introduced without delay into each of the districts throughout the country.

STAR-ROUTE CIVIL SUITS.

In the autumn of 1883 the Post-Office Department sent to this Department the papers necessary to be used in prosecuting the civil suits arising out of frauds in contracts for carrying the mail on star routes. These papers were placed in the hands of Mr. Simons, one of the chief Assistant Attorneys-General, for the purpose of examination. After he had had them some time he found that the work was of such magnitude that he could not give it the necessary attention without abandoning entirely his regular duties in the Court of Claims, which were of an important character, and he so reported to me. The papers were then partially examined by one of the district attorneys who was in Washington at that time, but as he subsequently wanted a large sum ($15,000) per annum to take charge of the cases, I declined to employ him. I then sent for another attorney, who had been recommended to me, but atter a preliminary examination of the papers he asked a compensation of $2,500 per month to undertake the suits. This proposition was also declined. I then concluded to detail one of the assistaut attorneys in the Department of Justice connected with the Court of Claims to arrange the cases for trial, and directed the different district attorneys to bring suits, so that I could thus superintend them myself and have them attended to promptly by the district attorneys in

places where jurisdiction attached. This has proved a proper course. The suits have been vigorously pressed. In fourteen cases instructions to bring suit have been given to the district attorneys, and in six or eight process has issued and the suits commenced. The gentleman whom I assigned to this work has for some time given them his undivided attention, and has lately been appointed special assistant United States attorney for the purpose, at a moderate compensation. He is now absent from the city on this duty, and has recently submitted to me a report of the condition of the suits, to which I invite your attention. That report in full is as follows:

DEPARTMENT OF JUSTICE,
Washington, November 30, 1884.

SIR: On the 12th of July last I received instructions from you to obtain such papers as were then in this Department pertaining to the proposed Star Route civil suits, to examine into and familiarize myself with the cases, and to report to you their condition, &c. I immediately proceeded to make such examination as was practicable with the incomplete records at hand, and on the 19th of July submitted a preliminary report upon the general character of the cases and offering certain suggestions as to the best course to be pursued in bringing the cases forward. On the 22d of July you addressed me a letter directing me to obtain from the Post-Office Department all the necessary documents and data required in the cases, and directing an immediate correspondence to be opened with the district attorneys in regard to the proposed suits.

In pursuance of these and other instructions which you have given from time to time, the following course has been pursued:

Letters were first addressed to different district attorneys, carefully explaining the character of the cases and requiring their prompt advice as to the practicability of successfully prosecuting the cases in their respective districts. As their replies were received the cases have been promptly taken up and the Post-Office Department called upon for such documents and data as each case required. As fast as these have come to hand from the Post-Office Department the cases have been prepared and transmitted with the least possible delay to the various district attorneys, accompanied by a letter of instructions (more or less in detail as circumstances demanded) directing the prompt commencement of proceedings to recover the amounts believed to be due from the different defendants. The papers in each case contain a carefully prepared statement, showing the exact sum which appears to have been improperly paid to the contractors and the method by which the conclusion is reached.

In preparing the papers and data, in response to my numerous calls upon them, the officials of the Post-Office Department have been very prompt and obliging. The work demanded of them has not been slight, and some delay has been and still is absolutely unavoidable.

In addition to the foregoing, I have given attention to some of the legal questions involved in the controversies. In several of the cases, owing to the fact that moneys were frequently paid to subcontractors and attorneys, questions of some nicety arise as to the proper parties to be made defendants.

In your instructions from time to time you have urged the utmost diligence in these cases consistent with that degree of care and accuracy which the importance of the cases demand, and I have sought to comply and believe I have complied with your wishes in this respect.

The actual status of the cases thus far finally acted upon by this Department is shown by the subjoined statement. In all of the cases not enumerated in this statement action is suspended awaiting the necessary documents and data from the Post-Office Department. The fact that more suits have not been actually begun is doubtless due to the fact that many of the cases are complicated and intricate, and that the

district attorneys are so largely occupied with their current work as to have been thus far unable (notwithstanding your urgent instructions in every case) to give the cases the attention they demand.

I have the honor to be, your obedient servant,

GEO. L. DOUGLASS,
Assistant Attorney.

Hon. BENJAMIN HARRIS BREWSTER,
Attorney-General.

STATEMENT.

Route No. 29149.—E. W. Parker, contractor; J. W. Parker, subcontractor. Overpayment, $30,851.22. Papers prepared and transmitted to United States attorney, with instructions for suit dated September 11, 1884. Suit brought November 19, 1884.

Route No. 38118.—A. H. Brown, contractor. Overpayment, $11,904.16. Papers prepared and transmitted to United States attorney with instructions for suit dated September 11, 1884. Suit brought September 29, 1884.

Route No. 32024.—V. W. Parker, contractor; J. W. Parker, subcontractor. Overpayment, $178,206.61. Papers prepared and transmitted to United States attorney, with instructions for suit dated September 18, 1884. Suit brought November 19, 1884.

Route No. 45103.—V. H. Pease, contractor; J. W. Parker, subcontractor. Overpayment, $5,753.37. Papers prepared and transmitted to United States attorney, with instructions for suit dated September 19, 1884. Suit brought November 19, 1884.

Route No. 46213.—William H. Force, contractor. Overpayment, $61,700.82. Papers prepared and transmitted to United States attorney, with instructions for suit dated September 23, 1884.

Route No. 31454.—John T. Chidester, contractor. Overpayment, $174,020.41. Papers prepared and transmitted to United States attorney, with instructions for suit dated October 7, 1884. Suit begun October 21, 1884.

Route No. 36107.—George H. Piatt, contractor; Monroe Salisbury, subcontractor. Overpayment, $99,556.20. Papers prepared and transmitted to United States attorney, with instructions for suit dated October 7, 1884.

Route No. 36115.—Thomas A. McDevitt, contractor; Monroe Salisbury, subcontractor. Overpayment, $30,690.16. Papers prepared and transmitted to United States attorney, with instructions for suit dated October 8, 1884.

Route No. 36128.—O. J. Salisbury, contractor; Monroe Salisbury, subcontractor. Overpayment, $14,931.17. Papers prepared and transmitted to United States attorney, with instructions for suit dated October 8, 1884.

Route No. 38155.—James B. Price, contractor; Monroe Salisbury, subcontractor. Overpayment, $18,460.68, Papers prepared and transmitted to United States Attorney, with instructions for suit, dated October 9, 1884.

Route No. 39116.—W. W. Giddings, contractor; Monroe Salisbury, subcontractor. Overpayment, $18,911.35. Papers prepared and transmitted to United States Attorney, with instructions for suit, dated October 10, 1884.

Route No 46120.—O. J. Salisbury and M. V. Nichols, contractors. Overpayment $56,001.87. Papers prepared and transmitted to United States Attorney, with instructions for suit, dated October 18, 1884.

Route No. 46267.—O. J. Salisbury, contractor; Monroe Salisbury, subcontractor. Overpayment, $52,568.47. Papers prepared and transmittsd to United States Attorney, with instructions for suit, dated October 22, 1884.

Route No. 31148.—James B. Price, contractor. Overpayment, $42,799.55. Papers prepared and transmitted to United States Attorney, with instructions for suit, dated November 11, 1884.

Route No. 40116.—W. M. Griffith, contractor. This case differed from the others in one material respect and admitted of a different course of proceeding. The Post-Office Department alleges that this contractor has been improperly paid $65,577.53 for "expedition" of the said route. At the same time the con ractor alleges that a large balance is due him for the service performed, for which balance he made claim upon the Department. The case involved "controverted questions" both of fact and of law, and the Postmaster-General, acting under the provisions of section 1063 of the Revised Statutes, therefore transmitted it to the Court of Claims, where it now awaits judicial determination. As that court will have full jurisdiction over the counter-claim of the Government, as well as over the claim of the contractor, there may be no occasion for any proceeding against the contractor in any other court.

THE EXAMINATION OF UNITED STATES COURT OFFICERS, DISTRICT ATTORNEYS, MARSHALS, COMMISSIONERS, ETC.

I am pleased to report to Congress that the condition of the public service, so far as it relates to officials connected with this Department, is, I am satisfied, greatly improved. This, I think it is safe to say, is in a large measure due to the active efforts which have been taken by this Department during the present administration in checking irregularities, correcting abuses, and punishing frauds and exactions committed by district attorneys, marshals, and commissioners, which have existed in a number of districts. From the first I have exercised a strict supervision in this respect which is still carried out. In some cases the evils were the result of the general inefficiency of the officer. In others, they could be attributed directly to dishonesty. In every case where these matters came to my attention I have done all in my power to remedy them, and in some cases have secured the conviction and public punishment of such offenders by fine and imprisonment.

It was my intention to form divisions in different parts of the country of that branch of the Department devoted to the examination of court officers, and for that purpose I requested Congress at the last session to appropriate $50,000, and this amount was strongly recommended by the Committee on Expenditures in the Department of Justice, which fact is the best evidence of the good work accomplished by this Department. While not granting this request, Congress did, however, give an increase of $10,000 over the appropriation of the previous year, and while this has not been deemed by me sufficient upon which to establish properly the divisions above referred to, it has enabled me to employ additional examiners, so that inspections could also be made in districts against which no specific charges had been preferred, thus enabling me to improve the service generally. The advantage of this course has been demonstrated, for in some cases deficiencies have been found where there had been no reason to suppose that any existed, and which, in some cases, grew out of misconstruction of the law.

In these efforts to improve the public service many difficulties have been experienced. This course was resisted by those delinquent officers and their adherents, who raised a clamor charging persecution;

but this was silenced by the convictions and imprisonments that followed, and the useful and purifying effect was soon felt in the whole service. In order that this strict supervision of the conduct and accounts of court officers may be continued, I recommend that the appropriation asked for in the estimates for the coming fiscal year for the prosecution of crimes and examination of accounts be passed.

Very respectfully, your obedient servant,

BENJAMIN HARRIS BREWSTER,

Attorney-General.

EXHIBITS.

EXHIBIT A.—*Statement showing number of civil suits to which the United States was a party pending in the district and circuit courts of the United States July 1, 1884, with the number terminated during the fiscal year ending June 30, 1884.*

Districts.	Number pending July 1, 1884.					Number terminated during the fiscal year ending June 30, 1884.																					Total number terminated and appealed.
						Judgments in favor of the United States.					Judgments for defendants.					Dismissed or discontinued.					Total.					Appealed from district court to circuit court.				Appealed from circuit court to Supreme Court.				
	Customs.	Internal revenue.	Post-office.	Miscellaneous.	Total.	Customs.	Internal-revenue.	Post-office.	Miscellaneous.	Total.	Customs.	Internal-revenue.	Post-office.	Miscellaneous.	Total.	Customs.	Internal-revenue.	Post-office.	Miscellaneous.	Total.	Customs.	Internal-revenue.	Post-office.	Miscellaneous.	Total.	Customs.	Internal-revenue.	Post-office.	Miscellaneous.	Total.	
Alabama, northern district	.....	10	2	.....	12	....	3	1	....	....	....	....	....	....	....	1	....	2	....	4	1	2	....	....	....	....	....	....	....	7
Alabama, middle district	.....	5	....	7	12	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1
Alabama, southern district	.....	....	....	26	26	1	....	....	22	....	....	....	....	....	....	....	....	....	64	1	....	....	86	....	....	....	....	....	....	....	87
Arkansas, eastern district	.....	....	....	1	1	....	....	....	10	....	....	....	....	1	....	....	....	....	....	....	....	11	....	....	....	....	....	....	....	11
Arkansas, western district	.....	....	....	38	38	....	....	1	20	....	....	....	....	3	....	....	....	....	20	....	....	1	43	....	....	....	....	....	....	....	44
California	21	24	3	52	100	4	2	....	4	....	1	....	1	4	1	....	13	8	4	....	18	....	....	....	....	....	....	3	....	33
Colorado	.....	....	3	26	29	....	....	5	4	....	....	....	1	....	....	....	6	....	....	5	11	....	....	....	....	....	....	1	....	17
Connecticut	.....	....	....	3	3	....	....	....	1	....	....	....	....	1	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	2
Delaware	.....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
Florida, northern district	10	3	1	6	20	....	....	2	18	....	....	....	1	....	1	....	9	....	1	2	28	....	....	....	....	....	....	....	....	31
Florida, southern district	1	1	....	2	4	3	....	....	....	....	....	....	....	1	....	....	....	....	4	....	....	....	....	....	....	....	....	....	....	....	4
Georgia, northern district	.....	22	....	93	115	....	19	....	1	....	....	....	3	....	64	2	3	....	83	2	7	....	....	....	....	....	....	....	....	92
Georgia, southern district	.....	....	....	.....	..	....	4	4	....	3	....	....	1	....	3	1	....	3	7	5	1	....	....	....	....	....	....	....	....	16
Illinois, northern district	20	11	3	9	43	1	1	....	....	1	....	....	2	1	1	....	1	3	2	....	3	....	....	....	....	....	....	....	....	8
Illinois, southern district	.....	12	....	16	28	....	2	....	3	....	....	....	....	....	1	2	1	....	3	2	4	....	....	....	....	....	....	....	....	9
Indiana	.....	1	....	4	5	....	....	....	....	....	....	....	....	....	2	....	2	....	2	....	2	....	....	....	....	....	....	....	....	4
Iowa, northern district	.....	....	....	1	1	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
Iowa, southern district	.....	5	4	5	14	....	....	....	....	....	....	....	....	....	1	....	4	....	1	....	4	....	....	....	....	....	....	....	....	5
Kansas	.....	....	....	27	27	....	....	....	2	....	....	....	....	....	....	....	4	....	....	....	6	....	....	....	....	....	....	....	....	6
Kentucky	.....	63	1	33	97	....	23	1	9	....	14	....	1	....	18	....	3	....	55	1	13	....	....	....	....	....	....	....	....	69
Louisiana, eastern district	9	11	....	50	70	4	3	....	7	3	1	....	....	....	1	....	11	7	5	....	18	2	....	....	....	....	....	....	....	32
Louisiana, western district	.....	....	....	14	14	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	1
Maine	10	....	....	1	11	5	....	....	....	1	....	....	....	....	....	....	6	....	....	....	....	....	....	....	....	....	....	....	....	6
Maryland	23	....	....	15	38	....	....	....	....	....	....	....	....	1	....	....	3	....	....	....	4	....	....	....	....	....	....	....	....	4

Massachusetts	231	36	10	26	303	2	2	....	5	2	....	....	1	10	18	....	4	14	20	....	10	....	....	2	1	....	....	47
Michigan, eastern district	2	....	1	4	7	1	....	....	....	....	....	....	1	....	....	....	....	1	....	....	1	1	....	....	....	....	....	3
Michigan, western district	....	....	1	4	5	....	1	1	9	....	....	....	....	....	....	....	3	....	1	1	12	....	....	....	....	1	....	15
Minnesota	26	1	....	26	53	....	1	....	14	....	....	....	3	....	5	1	15	....	6	1	32	....	....	....	....	....	....	39
Mississippi, northern district	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Mississippi, southern district	3	....	....	1	4	3	1	....	8	1	....	....	....	2	....	....	....	6	1	....	8	....	....	....	....	....	....	15
Missouri, eastern district	1	6	....	8	15	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	2
Missouri, western district	....	1	2	13	16	....	3	2	15	....	....	....	1	....	....	....	3	..	3	2	19	....	....	....	....	....	....	24
Nebraska	....	....	....	3	3	....	....	1	2	..	....	....	....	....	....	....	....	....	....	1	2	....	....	....	....	....	....	3
Nevada	....	....	....	1	1	....	....	1	..	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1
New Hampshire	....	....	....	4	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
New Jersey	4	5	....	2	11	2	2	....	1	....	....	....	....	1	1	..	2	3	3	....	3	....	....	....	....	....	....	9
New York, northern district	5	2	....	10	17	1	....	....	....	....	1	....	....	....	....	....	5	1	1	....	5	....	....	....	....	....	....	7
New York, southern district	2,535	95	52	47	2,729	25	3	6	2	2	2	....	1	157	6	99	2	184	11	105	5	3	1	....	1	....	....	310
New York, eastern district	61	277	1	53	392	1	3	1	1	....	2	....	....	....	2	....	....	1	7	1	1	....	....	....	....	....	....	10
North Carolina, eastern district	....	4	1	....	5	....	2	....	54	....	....	....	....	1	....	....	....	1	2	....	54	....	....	....	....	....	....	57
North Carolina, western district	....	18	....	....	18	....	52	....	61	....	13	1	....	....	2	....	26	....	67	1	87	....	....	....	....	....	....	155
Ohio, northern district	....	2	....	10	12	....	1	....	1	....	....	....	....	....	1	....	....	....	2	..	1	....	....	....	....	....	....	3
Ohio, southern district	14	11	....	7	32	....	2	8	3	1	....	....	....	....	6	....	5	1	8	8	8	....	....	....	....	....	....	25
Oregon	....	....	....	7	7	....	....	....	4	..	....	....	....	....	1	....	....	....	1	....	4	....	....	....	....	....	....	5
Pennsylvania, eastern district	137	34	1	25	197	1	15	2	4	7	5	....	13	29	36	6	8	37	56	8	25	....	1	1	2	4	1	135
Pennsylvania, western district	....	13	....	20	33	....	4	1	14	....	2	....	3	....	1	....	....	....	7	1	17	....	....	....	....	....	....	25
Rhode Island	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
South Carolina	1	8	1	....	10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tennessee, eastern district	....	5	....	11	16	....	2	....	19	....	....	....	....	....	....	....	12	....	2	....	31	....	....	....	....	....	....	33
Tennessee, middle district	....	14	....	11	25	....	5	1	20	..	3	....	1	....	2	1	6	....	10	2	27	....	1	....	....	....	....	40
Tennessee, western district	....	....	....	4	4	....	1	2	4	....	....	....	....	....	....	....	3	....	1	2	7	....	....	....	....	....	....	10
Texas, northern district	....	2	4	1	7	....	2	....	....	....	....	....	....	....	2	....	....	....	4	....	....	....	....	....	....	....	....	4
Texas, eastern district	....	....	1	99	100	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Texas, western district	1	....	..	9	10	....	....	....	7	....	....	....	....	....	....	....	1	....	....	....	8	....	....	....	....	....	1	9
Vermont	1	....	....	7	8	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1
Virginia, eastern district	....	6	....	3	9	1	7	....	4	....	4	....	....	....	....	....	2	1	11	....	6	....	....	....	....	....	....	18
Virginia, western district	....	4	....	....	4	....	5	....	....	....	....	....	2	....	....	....	....	....	5	....	2	....	....	....	....	....	....	7
West Virginia	....	....	....	4	4	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	....	....	....	....	..	....	1
Wisconsin, eastern district	....	....	....	7	7	....	1	....	1	....	....	....	....	....	1	....	1	....	2	....	2	....	....	....	....	....	....	4
Wisconsin, western district	....	...	....	4	4	....	....	....	1	....	....	....	....	....	....	....	2	...	....	....	3	....	....	....	....	....	....	3
Arizona	....	....	....	6	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Dakota	....	....	....	127	127	....	....	....	1	....	....	....	1	....	....	....	1	....	....	....	3	....	....	....	....	....	1	4
District of Columbia	5	1	24	34	64	....	1	....	1	....	....	....	....	1	....	....	4	1	1	....	5	....	....	....	....	....	....	7
Idaho	....	....	....	8	8	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....	....	....	....	1	2
Montana	....	....	..	1,111	1,111	....	....	....	....	....	....	....	1	....	....	1	....	....	....	1	1	....	....	....	....	....	....	2
New Mexico	1	....	2	31	34	....	....	2	6	....	....	....	....	1	....	....	4	1	....	2	10	....	....	....	....	....	1	14
Utah	....	....	....	7	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Washington	....	....	....	6	6	....	....	....	6	....	....	....	2	....	....	....	2	....	....	....	10	....	....	....	....	....	....	10
Wyoming	....	....	....	9	9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	3,122	713	118	2,199	6,152	56	173	43	371	21	48	1	46	209	178	113	259	286	399	157	676	6	3	3	4	5	9	1,548

EXHIBIT B 1.—*Statement showing the number of criminal prosecutions pending in the circuit and district courts of the United States on July* 1, 1884, *with the number terminated during the fiscal year ending June* 30, 1884.

Districts.	Number pending July 1, 1884.										Number terminated during the fiscal year ending June 30, 1884.													
											Customs.				Internal revenue.				Post-office.				Election laws.			
	Customs prosecutions.	Internal-revenue prosecutions.	Post-office prosecutions.	Prosecutions under the election laws.	Prosecutions under naturalization laws.	Prosecutions under intercourse laws.	Prosecutions under pension laws.	Prosecutions for embezzlement.	Miscellaneous prosecutions.	Total.	Convictions.	Acquittals.	Nolled, discontinued, or quashed.	Total.	Convictions.	Acquittals.	Nolled, discontinued, or quashed.	Total.	Convictions.	Acquittals.	Nolled, discontinued, or quashed.	Total.	Convictions.	Acquittals.	Nolled, discontinued, or quashed.	Total.
Alabama, northern district	....	99	5	....	....	....	....	....	17	121	....	....	.....	.....	98	16	36	150	4	....	.....	4	....	4	3	7
Alabama, middle district	82	32	4	....	....	....	....	....	34	152	85	24	108	217	16	5	46	67	2	1	1	4	....	....	4	4
Alabama, southern district	....	1	2	....	....	....	....	....	54	57	....	....	.....	.....	2	1	6	9	....	....	.....	.....	....	....	4	4
Arkansas, eastern district	....	28	....	....	....	....	....	....	.....	28	....	....	.....	.....	43	8	11	62	5	....	.....	5	....	....	.....	....
Arkansas, western district	....	9	....	....	....	47	....	....	7	63	....	....	.....	.....	104	2	20	126	1	....	.....	1	....	....	....	....
California	5	6	6	....	....	..	....	3	35	55	12	2	6	20	10	6	7	23	8	2	1	11	....	....	1	1
Colorado	....	5	6	1	....	....	....	..	8	20	....	....	.....	.....	1	....	6	7	6	3	4	13	1	1	1	3
Connecticut	..	.....	1	..	....	....	....	....	.....	1	....	....	.....	.....	2	....	2	4	6	....	2	8	....	....	.....	....
Delaware	....	4	....	1	....	....	....	....	.....	5	....	....	.....	.....	10	....	3	13	....	....	.....	.....	....	....	2	2
Florida, northern district	..	8	1	....	..	....	2	....	11	22	....	....	1	1	6	1	29	36	6	1	6	13	....	....	14	14
Florida, southern district	1	1	..	....	....	....	....	....	11	13	1	3	1	5	....	....	.....	.....	....	....	.....	....	....	....	.....	....
Georgia, northern district	....	153	2	....	....	....	....	2	84	241	....	....	.....	.....	342	70	99	511	4	....	.....	4	4	....	.....	4
Georgia, southern district	....	30	4	..	....	....	2	2	6	44	....	1	2	3	46	36	26	108	2	2	8	12	....	....	.....	....
Illinois, northern district	....	10	9	....	..	....	2	1	1	23	....	....	.....	.....	39	4	13	56	25	3	7	35	....	....	.....	....
Illinois, southern district	....	20	1	1	....	....	24	..	18	64	....	....	.....	.....	118	21	.....	139	12	2	7	21	....	....	2	2
Indiana	...	8	4	4	....	....	12	....	6	34	....	....	.....	.....	2	...	12	14	10	1	2	13	....	....	.....	....
Iowa, northern district	....	25	....	....	....	....	.	....	10	35	....	....	.....	.....	111	...	32	143	....	....	.....	.....	....	....	.....	....
Iowa, southern district	....	73	10	1	....	...	1	....	9	94	....	....	.....	.....	72	7	21	100	...	....	3	3	....	....	.....	....
Kansas	....	29	10	....	....	6	3	1	55	104	..	...	.....	.....	2	7	18	27	2	2	5	9	...	....	.....	....
Kentucky	....	33	1	....	....	....	5	...	19	58	....	....	.....	.....	199	75	73	347	10	4	12	26	....	....	.....	....
Louisiana, eastern district	3	22	63	58	....	....	6	....	28	180	....	....	.....	.....	.....	1	14	15	3	....	156	159	....	....	31	31
Louisiana, western district	....	54	11	9	....	....	....	..	.....	74	..	....	.....	.....	15	5	18	38	2	....	.....	2	....	....	.....	....
Maine	2	6	1	....	....	....	3	..	2	14	6	....	.....	6	13	3	18	34	3	....	1	4	....	....	.....	....
Maryland	1	3	5	1	....	....	6	.	4	20	1	1	1	3	5	...	.....	5	4	2	1	7	....	...	4	4
Massachusetts	6	54	17	....	4	....	17	2	17	117	2	4	2	8	19	5	13	37	15	3	7	25	....	....	.....	....
Michigan, eastern district	1	11	2	....	....	....	5	1	6	26	6	....	1	7	49	1	21	71	6	....	.....	6	....	....	.....	....
Michigan, western district	1	22	..	....	....	....	2	....	8	33	1	....	1	2	20	....	13	33	7	1	3	11	....	....	.....	....
Minnesota	....	9	1	....	....	13	1	....	23	47	....	....	.....	.....	12	....	3	15	6	....	.....	6	....	....	.....	....
Mississippi, northern district	....	56	4	....	...	....	..	....	4	64	....	....	.....	.....	43	3	6	52	2	....	.....	2	11	7	6	24
Mississippi, southern district	1	.....	....	....	....	....	1	....	1	3	1	....	1	2	.....	....	.....	.....	....	....	3	3	....	....	.....	....

Missouri, eastern district	....	31	1	...	....	....	2	1	9	44	....	....	.....	.....	68	1	42	111	13	....	4	17	....	....	.....	....
Missouri, western district	....	23	6	....	....	....	7	....	12	48	....	....	.....	.....	44	3	13	60	14	....	6	20	1	....	.....	1
Nebraska	....	34	2	....	....	....	..	....	6	42	....	....	.....	.....	70	....	24	94	7	....	.....	7	....	....	.....	....
Nevada	....	.....	2	1	....	....	....	....	.....	3	....	....	.....	.....	.....	....	1	1	2	....	1	3	....	....	.....	....
New Hampshire	....	.....	....	...	....	....	..	....	17	17	....	....	.....	.....	.....	....	.....	.....	...	...	.....	..	...	....	.....	....
New Jersey	3	3	4	1	....	....	7	....	6	24	17	1	.....	18	11	2	2	15	11	1	.....	12	....	1	.....	1
New York, northern district	3	12	7	....	....	....	1	...	8	31	8	....	5	13	72	2	12	86	18	1	16	35	1	....	.....	1
New York, southern district	7	39	17	....	....	....	4	....	62	129	2	....	8	10	3	....	5	8	19	2	8	29	....	....	.....	....
New York, eastern district	3	24	4	5	....	....	....	....	14	50	15	....	.....	15	15	1	1	17	1	...	.....	1	1	....	.....	1
North Carolina, eastern district	....	28	1	3	....	....	....	....	2	34	....	....	.....	.....	27	8	21	56	1	4	.....	5	....	1	2	3
North Carolina, western district	....	142	1	2	....	....	1	....	1	147	....	....	.....	.....	163	52	69	284	1	1	....	2	....	....	.....	....
Ohio, northern district	...	4	....	....	2	...	7	3	18	34	....	....	.....	.....	17	...	4	21	12	2	4	18	....	....	.....	....
Ohio, southern district	....	9	13	1	....	1	8	....	19	51	....	....	.....	.....	10	....	17	27	7	....	9	16	....	....	.....	....
Oregon	....	2	2	2	....	....	....	....	4	10	....	....	.....	.....	2	1	2	5	2	1	.....	3	1	...	.....	1
Pennsylvania, eastern district	....	11	3	1	...	..	14	...	13	42	....	....	.....	.....	5	2	41	48	9	5	1	15	...	....	2	2
Pennsylvania, western district	....	22	11	....	....	....	6	....	18	57	...	....	.....	.....	25	2	6	33	15	7	1	23	....	....	.....	....
Rhode Island	....	8	....	....	....	....	3	...	5	16	...	....	.....	.....	.....	....	1	1	...	....	.....	.....	.....	....	.....	....
South Carolina	....	112	2	....	....	....	....	....	36	150	....	....	.....	.....	188	59	144	391	5	....	2	7	1	1	44	46
Tennessee, eastern district	....	163	....	....	....	....	11	....	13	187	....	....	.....	.....	399	43	23	465	5	1	.....	6	....	....	.....	....
Tennessee, middle district	....	75	1	....	....	....	3	....	12	91	....	...	.....	.....	235	47	62	344	4	...	1	5	....	3	.....	3
Tennessee, western district	....	33	1	....	....	....	2	..	19	55	....	....	.....	.....	22	1	2	25	7	1	.....	8	....	....	.....	....
Texas, northern district	....	31	17	....	....	....	....	1	34	83	....	....	.....	.....	1	9	39	49	7	4	8	19	....	....	.....	....
Texas, eastern district	....	43	14	....	....	....	....	....	3	60	....	....	.....	.....	1	2	9	12	1	....	5	6	...	....	19	19
Texas, western district	27	7	14	1	1	....	....	1	28	79	61	5	76	142	16	2	3	21	8	2	.....	10	....	....	.....	....
Vermont	....	3	7	....	....	....	1	....	6	17	5	....	.....	5	2	....	7	9	2	...	2	4	....	....	.....	....
Virginia, eastern district	....	5	20	15	....	2	1	....	6	49	....	....	.....	.....	8	7	6	21	7	....	1	8	....	....	.....	....
Virginia, western district	....	238	4	2	....	....	67	...	7	318	....	....	.....	.....	32	29	180	241	3	1	2	6	1	3	.....	4
West Virginia	...	326	45	...	....	....	4	...	47	422	3	1	4	8	116	66	63	245	14	5	6	25	....	..	.....	....
Wisconsin, eastern district	....	8	2	....	....	....	2	....	1	13	....	....	.....	.....	2	....	9	11	8	....	.....	8	....	....	.....	....
Wisconsin, western district	....	1	6	....	....	....	1	....	32	40	....	....	.....	.....	5	....	4	9	4	....	.....	4	1	....	.....	1
Arizona	2	.....	....	....	....	....	....	...	.....	2	....	...	.....	.....	4	....	.....	4	4	1	.....	5	..	....	.....	....
Dakota	....	9	1	....	...	4	....	....	41	55	2	1	.....	3	6	1	3	10	5	1	2	8	....	....	.....	....
District of Columbia	....	.....	17	....	....	....	....	....	879	896	....	....	.....	.....	.....	....	.....	.....	6	1	2	9	....	....	.....	....
Idaho	....	.....	....	....	....	....	....	....	23	23	....	....	.....	.....	3	....	.....	3	....	....	.....	.....	....	....	.....	....
Montana	....	.....	....	....	....	....	....	....	8	8	....	....	.....	.....	.....	....	.....	.....	....	....	.....	.....	....	....	.....	....
New Mexico	....	27	3	8	....	10	....	1	121	170	....	....	1	1	2	14	37	53	....	3	.....	3	....	....	3	7
Utah	....	.....	....	....	....	....	....	28	82	110	....	....	.....	.....	.....	1	1	2	1	....	1	2	....	....	.....	....
Washington	...	1	1	....	....	4	....	....	8	14	2	....	.....	2	1	1	.....	2	1	1	.....	2	....	....	.....	....
Wyoming	....	.....	..	....	....	....	....	....	4	4	...	....	.....	.....	.....	....	.....	.....	...	....	.....	.....	....	....	.....	....
Total	148	2,285	399	118	7	87	244	47	2,102	5,437	230	43	218	491	2,974	633	1,419	5,026	375	72	311	758	26	23	141	190

EXHIBIT B 2.—*Statement showing the number of criminal prosecutions pending in the district and circuit courts of the United States on July 1, 1884, with the number terminated during the fiscal year ending June 30, 1884.*

Districts.	Number terminated during the fiscal year ending June 30, 1884.																				Total number terminated during the fiscal year ending June 30, 1884.
	Civil-rights act.			Naturalization laws—convictions.	Intercourse laws.				Pension laws.				Embezzlement.				Miscellaneous.				
	Acquittals.	Nolled, discontinued, or quashed.	Total.		Convictions.	Acquittals.	Nolled, discontinued, or quashed.	Total.	Convictions.	Acquittals.	Nolled, discontinued, or quashed.	Total.	Convictions.	Acquittals.	Nolled, discontinued, or quashed.	Total.	Convictions.	Acquittals.	Nolled, discontinued, or quashed.	Total.	
Alabama, northern district	.....	.....	.....	.....	.....	..	.....	...	.....	.....	.....	...	1	1	.....	2	18	5	35	58	221
Alabama, middle district	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	1	19	22	314
Alabama, southern district	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	75	12	71	158	172
Arkansas, eastern district	.....	.....	.....	.....	.....	.....	.....	.....	1	...	.....	1	...	.....	.....	.....	8	.....	.....	8	76
Arkansas, western district	.....	...	.....	.....	299	63	77	439	.....	.....	.....	...	1	.....	.....	1	6	2	5	13	580
California	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30	11	22	63	118
Colorado	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	1	5	11	34
Connecticut	.....	.....	.....	.....	.....	.....	.....	.....	2	1	.....	3	.....	.....	.....	.....	3	.....	1	4	19
Delaware	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	16
Florida, northern district	2	1	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	.....	.....	1	1	4	3	17	24	94
Florida, southern district	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	1	2	5	10
Georgia, northern district	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	3	5	9	3	26	38	562
Georgia, southern district	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	7	35	50	174
Illinois, northern district	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	2	1	.....	.....	1	9	6	3	18	112
Illinois, southern district	.....	.....	.....	.....	.....	.....	.....	.....	35	3	5	43	.....	.....	.....	.....	23	4	20	47	252
Indiana	1	.....	1	.....	.....	.....	.....	.....	6	2	2	10	.....	.....	.....	.....	22	3	8	33	71
Iowa, northern district	.....	.....	.....	.....	.....	.....	.....	.....	1	...	1	2	.....	.....	.....	.....	8	.....	8	16	161
Iowa, southern district	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	5	108
Kansas	.....	1	1	.....	2	1	2	5	....	1	1	2	.....	.....	1	1	11	2	20	33	78
Kentucky	.....	1	1	.....	.....	.....	.....	.....	7	1	3	11	.....	.....	.....	..	16	7	7	30	415
Louisiana, eastern district	.....	1	1	.....	.....	.....	.....	.....	..	....	2	2	.....	.....	.....	.....	.....	4	4	8	216
Louisiana, western district	.....	.....	.	.....	.....	.....	...	.....	.....	...	...	.....	.....	.....	.....	.....	9	.....	13	22	62
Maine	.....	.....	.....	.....	.....	...	.....	...	4	....	1	5	.....	.....	.....	.	5	2	1	8	57
Maryland	.....	.....	.....	.....	...	...	.....	....	3	...	.....	3	.....	.....	.....	...	5	2	3	10	32
Massachusetts	.....	1	1	5	....	....	.....	..	12	2	1	15	1	.....	.....	1	31	8	9	48	140
Michigan, eastern district	.....	.....	.....	.....	.....	.....	.....	...	12	....	2	14	.....	.....	2	2	18	.....	2	20	120
Michigan, western district	.....	.....	.....	.....	.....	.....	.....	...	2	...	.....	2	.....	.....	.....	...	15	2	5	22	70
Minnesota	.....	.....	.....	.....	19	....	3	22	1	...	....	1	.....	.....	1	1	21	.....	5	26	71
Mississippi, northern district	.....	.....	.....	.....	.....	.....	.....	.....	...	...	.....	...	.....	.....	.....	...	.....	.....	6	6	84
Mississippi, southern district	.....	.....	.....	.....	.....	.....	.....	.....	1	....	.....	1	.....	.....	.....	.....	1	2	5	8	14

Missouri, eastern district									5			5					16	1	22	39	172
Missouri, western district									2		1	3					46	9	16	71	155
Nebraska															1	1	27	1	6	34	136
Nevada																	1		1	2	6
New Hampshire																	2		14	16	16
New Jersey									3	1		4					3	1		4	54
New York, northern district									1	1	2	4			1	1	15	6	24	45	185
New York, southern district		1	1														17	3	8	28	76
New York, eastern district									1			1					13	1	4	18	53
North Carolina, eastern district																	4	1	4	9	73
North Carolina, western district		1	1														2	1		3	290
Ohio, northern district									1	2		3	1			1	1		3	4	47
Ohio, southern district					1		22	23	6	6	3	15					14	1	4	19	100
Oregon					123	5	5	133									6	2	6	14	156
Pennsylvania, eastern district									20	10	9	39					12	5	20	37	141
Pennsylvania, western district									29	3	2	34					6	4	1	11	101
Rhode Island																	1			1	2
South Carolina										1	2	3					6	1	13	20	467
Tennessee, eastern district																	9	4	2	15	486
Tennessee, middle district		1	1						2	6		8					5	6	5	16	377
Tennessee, western district									10	3		13			2	2	3	6	1	10	58
Texas, northern district		10	10											1	5	6	8	7	25	40	124
Texas, eastern district																	1	2	4	7	44
Texas, western district																		1	15	16	189
Vermont									1			1					4			4	23
Virginia, eastern district					4	2		6	2	1	1	4					1		4	5	44
Virginia, western district																			1	1	252
West Virginia										1		1					8	2	7	17	296
Wisconsin, eastern district										1		1					9	3	4	16	36
Wisconsin, western district									2			2	1			1	20	2	4	26	43
Arizona																	7		1	8	17
Dakota					10	5	4	19									26	8	11	45	85
District of Columbia																	2,495	823	99	3,417	3,426
Idaho																	2	5	9	16	19
Montana																	7	7	17	31	31
New Mexico					1	5	8	14					1			1	4	4	33	41	120
Utah													3	2	5	10	64	30	44	138	152
Washington					19		2	21									6	3	1	10	37
Wyoming																					
Total	3	20	23	5	478	81	123	682	173	47	40	26	12	4	22	38	3,235	1,038	796	5,069	12,542

EXHIBIT C 1.—*Statement of the amount arising from civil suits to which the United States was a party, and from criminal prosecutions in the circuit and district courts of the United States, during the fiscal year ending June* 30, 1884.

Districts.	Amount of judgments obtained during the year in favor of the United States.					Amounts of fines, forfeitures, and penalties imposed during the year.								
	Customs.	Internal revenue.	Post-office.	Miscellaneous.	Total.	Customs.	Internal revenue.	Post-office.	Election laws.	Intercourse laws.	Pension laws.	Embezzlement.	Miscellaneous.	Total.
Alabama, northern district	.....	$283 56	$88 63	.....	$372 19	.....	$5,500 00	$1,100 00	.....	.....	.....	.....	$861 00	$7,461 00
Alabama, middle district	.....	.....	58 22	.....	58 22	$1,012 00	1,050 00	.....	.....	.....	.....	.....	.....	2,062 00
Alabama, southern district	$326 00	.....	.....	$1,200 00	1,526 00	.....	101 00	.....	.....	.....	.....	.....	2,076 15	2,177 15
Arkansas, eastern district	.....	.....	.....	7,978 04	7,978 04	.....	7,848 53	662 64	.....	.....	.....	.....	6,860 32	15,371 49
Arkansas, western district	.....	.....	502 20	31,132 52	31,634 72	.....	11,530 00	.....	.....	$8,861 00	.....	.....	20 00	20,411 00
California	3,440 20	69,500 00	.....	45,675 02	118,615 22	1,700 00	275 00	590 00	.....	.....	.....	.....	917 50	3,482 50
Colorado	.....	.....	2,472 29	411 46	2,883 75	.....	.....	.....	.....	.....	.....	.....	750 00	750 00
Connecticut	.....	.....	.....	68 40	68 40	.....	.....	53 00	.....	.....	$594 84	.....	104 00	751 84
Delaware	.....	.....	.....	.....	.....	.....	900 00	.....	.....	.....	.....	.....	.....	900 00
Florida, northern district	.....	.....	1,594 72	4,579 84	6,174 56	.....	.....	.....	.....	.....	.....	.....	.....	.....
Florida, southern district	149 86	.....	.....	.....	149 86	69 70	.....	.....	.....	.....	.....	.....	.....	69 70
Georgia, northern district	.....	5,323 41	.....	.....	5,323 41	.....	28,873 41	.....	.....	.....	.....	.....	.....	28,873 41
Georgia, southern district	.....	9,791 69	1,420 79	.....	11,212 48	.....	5,610 81	471 85	$118 40	.....	.....	.....	2,027 65	8,228 71
Illinois, northern district	120 02	44 08	.....	.....	164 10	.....	2,373 31	7,813 12	.....	.....	.....	.....	1,607 25	11,793 68
Illinois, southern district	.....	7,012 64	.....	3,825 00	10,837 64	.....	9,850 00	560 00	.....	.....	2,031 00	.....	.....	12,441 00
Indiana	.....	.....	.....	.....	.....	.....	41 30	2,229 71	.....	.....	1,374 02	.....	3,118 03	6,763 06
Iowa, northern district	.....	.....	.....	.....	.....	.....	5,632 26	.....	.....	.....	451 21	.....	130 19	6,213 66
Iowa, southern district	.....	.....	.....	.....	.....	.....	890 00	251 80	.....	.....	1,199 35	.....	1 00	2,342 15
Kansas	.....	.....	.....	.....	.....	.....	20 00	1 00	.....	51 00	.....	.....	44 60	116 60
Kentucky	.....	1,272 45	492 15	1,600 00	3,364 60	.....	17,510 80	610 00	.....	.....	3,450 00	.....	130 00	21,700 80
Louisiana, eastern district	1,755 00	2,702 50	.....	1,215 00	5,672 50	.....	.....	50 00	.....	.....	.....	.....	.....	50 00
Louisiana, western district	.....	.....	.....	.....	.....	.....	340 00	1 00	.....	.....	.....	.....	605 50	946 50
Maine	3,686 19	.....	.....	.....	3,686 19	375 00	1,065 00	155 00	.....	.....	360 00	.....	1,823 00	3,778 00
Maryland	.....	.....	.....	.....	.....	.....	275 00	525 00	.....	.....	.....	.....	200 00	1,000 00
Massachusetts	182 48	8,491 21	.....	6,777 87	15,451 56	.....	1,176 00	850 00	.....	.....	1,335 00	.....	1,260 00	4,621 00
Michigan, eastern district	.....	.....	.....	.....	.....	250 00	125 00	350 00	.....	.....	345 00	.....	1,300 00	2,370 00
Michigan, western district	.....	2,943 03	721 30	3,495 43	7,159 76	.....	1,838 25	253 90	.....	.....	175 00	.....	1,075 13	3,342 28
Minnesota	.....	223 90	.....	8,958 06	9,181 96	.....	865 54	60 00	.....	629 00	.....	$50 00	942 00	2,546 54
Mississippi, northern district	.....	.....	.....	.....	.....	.....	1,330 00	.....	85 00	.....	.....	.....	45 00	1,460 00
Mississippi, southern district	10 65	71,375 00	.....	811 49	72,197 14	40 00	.....	.....	.....	.....	.....	.....	.....	40 00
Missouri, eastern district	.....	.....	.....	24,831 10	24,831 10	.....	1,807 00	1,362 00	.....	.....	115 00	.....	338 50	3,622 50
Missouri, western district	.....	49,274 56	1,328 43	.....	50,602 99	.....	9,907 53	2,137 77	.....	.....	524 62	.....	11,533 90	24,103 82

Nebraska			48 90	9,508 63	9,557 53		1,525 00	400 00					531 00	2,456 00
Nevada			657 77		657 77			50 00					500 00	550 00
New Hampshire														
New Jersey	7,710 01	597 60		20,000 00	28,307 61	1,275 00	410 00	1,100 00						2,785 00
New York, northern district						535 00	2,500 00	2,280 00	100 00		100 00		610 00	6,125 00
New York, southern district	28,478 64	796 74	455 27	15,271 75	45,002 40	500 00		1,500 00					507 00	2,507 00
New York, eastern district	25 94	2,826 69	85 19		2,937 82	951 00	170 00						39 00	1,160 00
North Carolina, eastern dist		259 68		4,276 00	4,535 68		1,701 00						517 00	2,218 00
North Carolina, western dist		6,667 52		11,630 00	18,297 52		15,690 00	100 00					110 00	15,900 00
Ohio northern district		181 93		11,653 66	11,835 59		795 00	950 00			50 00		40 00	1,835 00
Ohio, southern district		361 60	80 00	2,139 70	2,581 30		370 00	430 00		25 00	200 00		350 00	1,375 00
Oregon				2,263 44	2,263 44		200 00	25 00	162 50	1,190 00				1,577 50
Pennsylvania, eastern district	1,047 07	28,503 86	684 24	70,500 61	100,735 78		180 00	345 00			3,606 00		1,305 00	5,436 00
Pennsylvania, western district		115 72	158 91	4,173 77	4,448 40		400 00	1,630 06			836 00		105 00	2,971 06
Rhode Island													25 00	25 00
South Carolina														
Tennessee, eastern district		1,236 86		7,558 07	8,794 93		10,078 60	663 17					1,060 54	11,802 31
Tennessee, middle district		279 07	158 58	109,746 08	110,183 73		13,224 49	60 45			324 90		1,181 22	14,791 06
Tennessee, western district		8,570 80	814 05	1,352 75	10,737 60		2,436 69	852 33			1,204 97			4,493 99
Texas, northern district		622 59			622 59		322 53	1,550 00					1,267 00	3,139 53
Texas, eastern district				800 00	800 00		297 30						1 00	298 30
Texas, western district				21,401 61	21,401 61	895 00	935 00							1,830 00
Vermont	289 26				289 26	2,055 44	1,875 55	117 00					2 00	4,049 99
Virginia, eastern district	506 00	5,235 62		12,624 30	18,365 92	500 00	25 00			3,760 50	500 00			4,785 50
Virginia, western district		95 30			95 30		3,331 18	5 00						3,336 18
West Virginia						345 66	16,994 60	5,977 01					5,830 96	29,148 23
Wisconsin, eastern district		25,000 00			25,000 00		200 00	5,626 34					288 53	6,114 87
Wisconsin, western district				349 25	349 25		587 04	1,850 00			1,000 00	175 00	2,237 70	5,849 74
Arizona							320 00						7 40	327 40
Dakota				52 00	52 00		352 50	500 00		1,075 00			3,726 00	5,653 50
District of Columbia		661 18		1,087 30	1,748 48									
Idaho							75 00						24 00	99 00
Montana														
New Mexico				22,497 31	22,497 31		6 00		3 50	5 00			4 00	18 50
Utah													823 25	823 25
Washington				4,132 10	4,132 10	550 00	100 00	100 00		300 00			1,055 00	2,105 00
Wyoming														
Total	47,727 32	310,250 79	11,821 64	475,577 56	845,377 31	11,053 80	191,838 22	46,199 15	469 40	15,896 50	19,776 91	225 00	59,918 32	345,377 30

EXHIBIT C 1.—*Statement of the amounts arising from civil suits to which the United States was a party, &c.*—Continued.

Districts.	Amounts realized from judgments obtained during the year.					Amounts realized on fines, forfeitures, and penalties imposed during the year.							
	Customs.	Internal revenue.	Post-office.	Miscellaneous.	Total.	Customs.	Internal revenue.	Post-office.	Election laws.	Intercourse laws.	Pension laws.	Miscellaneous.	Total.
Alabama, northern district								$33 30					$33 30
Alabama, middle district												$9 25	9 25
Alabama, southern district	$326 00				$326 00							16 00	16 00
Arkansas, eastern district				$1,429 01	1,429 01		$1,046 77					209 30	1,256 07
Arkansas, western district			$66 65	835 46	902 11		30 00			$80 00		20 00	130 00
California	3,440 20	$69,500 00		34,838 02	107,778 22	$700 00	175 00	540 00				260 50	1,675 50
Colorado			406 63		406 63							50 00	50 00
Connecticut											$594 84	102 00	696 84
Delaware													
Florida, northern district				3,103 22	3,103 22								
Florida, southern district	119 02				119 02	69 70							69 70
Georgia, northern district		56 91			56 91		10 00						10 00
Georgia, southern district		515 41	1,326 40		1,841 81		634 58	189 90	$118 40			364 35	1,307 23
Illinois, northern district	120 02				120 02		1,426 92	2,266 16					3,693 08
Illinois, southern district							2,201 12	806 15			1,619 11		4,626 38
Indiana								248 91			898 51		1,147 42
Iowa, northern district							2,061 00						2,061 00
Iowa, southern district							265 00	242 30					507 30
Kansas							10 00					30 30	40 30
Kentucky		1,160 06		102 80	1,262 86		710 80	413 05				425 27	1,549 12
Louisiana, eastern district		2,702 50			2,702 50								
Louisiana, western district							10 00					153 00	163 00
Maine	3,686 19				3,686 19	275 00	40 00	50 00			360 00	813 00	1,538 00
Maryland								525 00					525 00
Massachusetts	182 48			6,777 87	6,960 35		1,176 00	850 00			1,335 00	1,010 00	4,371 00
Michigan, eastern district						250 00	125 00	250 00			345 00	300 00	1,270 00
Michigan, western district				460 20	460 20		1,813 25	153 90			175 00	1,075 13	3,217 28
Minnesota				2,206 66	2,206 66		860 54	50 00		506 00		566 80	1,983 34
Mississippi, northern district							135 00		85 00			40 00	260 00
Mississippi, southern district	10 65	7,500 00		811 49	8,322 14	40 00							40 00
Missouri, eastern district				12,487 14	12,487 14		1,775 88	808 26			86 95	304 80	2,975 89
Missouri, western district		4,844 01			4,844 01		1,854 47	441 45				839 65	3,135 57
Nebraska							145 00	50 00					195 00

Nevada			150 00		150 00								
New Hampshire													
New Jersey						1,275 00	260 00	1,100 00					2,635 00
New York, northern district						410 00	1,760 00	1,080 00	100 00		100 00	320 00	3,770 00
New York, southern district	6,978 90	794 74	3 5 53	5,600 00	13,689 17	500 00		1,500 00				500 00	2,500 00
New York, eastern district	25 94	2,826 69	85 19		2,937 82	901 00	170 00					35 00	1,106 00
North Carolina, eastern district							818 00					377 65	1,195 65
North Carolina, western district		560 55		305 37	865 92		527 17						527 17
Ohio, northern district		181 93			181 93		495 00	710 00			50 00	40 00	1,295 00
Ohio, southern district		361 60	80 00	2,017 70	2,459 30		75 00	230 00		25 00	200 00		530 00
Oregon				1,013 44	1,013 44		200 00		162 50	563 90			926 40
Pennsylvania, eastern district		163 34			163 34		60 00				336 00		396 00
Pennsylvania, western district			158 91	1,773 77	1,932 68			500 00			637 00		1,137 00
Rhode Island													
South Carolina													
Tennessee, eastern district		1,236 86		164 47	1,401 33		2,423 90	50 57				364 97	2,839 44
Tennessee, middle district		279 07		5,935 28	6,214 35		4,725 73	60 45				375 77	5,161 95
Tennessee, western district			814 05		814 05		377 96	394 54			651 30		1,423 80
Texas, northern district		463 89			463 89		301 19						301 19
Texas, eastern district				50 00	50 00		197 30						197 30
Texas, western district				300 00	300 00	150 00	210 00	25 00					385 00
Vermont	289 26				289 26	2,055 44	675 55	117 00					2,847 99
Virginia, eastern district	5 34	6 34		345 05	356 73		25 00			3,760 50			3,785 50
Virginia, western district		38 92			38 92		631 18						631 18
West Virginia						24 51	547 32					54 10	625 93
Wisconsin, eastern district							200 00	282 75				288 53	771 28
Wisconsin, western district				349 25	349 25			185 00	2,646 40			1,037 00	3,868 40
Arizona							20 00					7 40	27 40
Dakota				52 00	52 00		152 50			225 00		2,626 00	3,003 50
District of Columbia				1,087 30	1,087 30								
Idaho												24 00	24 00
Montana													
New Mexico													
Utah												823 25	823 25
Washington				2,796 35	2,796 35	550 00	100 00	100 00		25 00		655 00	1,430 00
Wyoming													
Total	15,184 00	93,192 82	3,403 36	84,841 85	196,622 03	7,200 65	31,459 13	14 253 69	3,112 30	5,185 40	7,388 71	14,118 02	82,717 90

EXHIBIT C 1.—*Statement of the amounts arising from civil suits to which the United States was a party, &c.*—Continued.

Districts.	Amounts realized on fines, forfeitures, and penalties imposed in former years.						Amounts realized on judgments obtained in former years.					Amounts realized during the year by compromise, and otherwise, included in the foregoing.				
	Customs.	Internal revenue.	Post-office.	Pension laws.	Miscellaneous.	Total.	Customs.	Internal revenue.	Post-office.	Miscellaneous.	Total.	Customs.	Internal revenue.	Post-office.	Miscellaneous.	Total.
Alabama, northern district								$200 00			$200 00					
Alabama, middle district																
Alabama, southern district																
Arkansas, eastern district									$324 22	$185 00	509 22					
Arkansas, western district																
California																
Colorado								3,151 85			3,151 85			$2,351 91		$2,351 91
Connecticut												$400 00				400 00
Delaware							$37 18				37 18					
Florida, northern district																
Florida, southern district																
Georgia, northern district								629 80			629 80		$165 80			165 80
Georgia, southern district									625 65		625 65		253 83			253 83
Illinois, northern district	$300 00	$76 79	$144 69			$521 48	147 16	2,826 70			2,973 86	71 79				71 79
Illinois, southern district		276 42	100 00			376 42				438 22	438 22		259 74			259 74
Indiana			6 15		$32 08	38 23				80 83	80 83		16 06		$218 22	234 28
Iowa, northern district		455 60				455 60										
Iowa, southern district		186 75				186 75		12,075 41	236 14		12,311 55					
Kansas										29,234 02	29,234 02					
Kentucky									73 51		73 51					
Louisiana, eastern district																
Louisiana, western district																
Maine		764 51				764 51	1,088 00				1,088 00					
Maryland																
Massachusetts													230 33		1,281 09	1,511 42
Michigan, eastern district																
Michigan, western district					168 50	168 50				1,107 46	1,107 46					
Minnesota															1,652 48	1,652 48
Mississippi, northern district																
Mississippi, southern district																
Missouri, eastern district										86 08	86 08					
Missouri, western district			124 25			124 25										
Nebraska		256 18				256 18				5,495 00	5,495 00					

Nevada																
New Hampshire																
New Jersey									3,324 53		3,324 53	2,064 54	500 00			2,564 54
New York, northern district							1,777 18	7,615 13	189 98	35 74	9,618 03	21,475 21	67,235 93	3,576 41	409 85	92,697 40
New York, southern district																
New York, eastern district																
North Carolina, eastern district		446 00				446 00		252 70			252 70					
North Carolina, western district		100 00				100 00		2,089 74	500 00	111 81	2,701 55		750 00			750 00
Ohio, northern district		10 00			10 00	20 00				110 00	110 00		200 00			200 00
Ohio, southern district			10 00	$50 00		60 00		1,500 00			1,500 00		200 00		706 54	906 54
Oregon					200 00	200 00										
Pennsylvania, eastern district												375 00	90 00	928 35		1,393 35
Pennsylvania, western district		500 00				500 00							49,566 61			49,566 61
Rhode Island																
South Carolina																
Tennessee, eastern district		806 59				806 59				61 53	61 53					
Tennessee, middle district		373 41				373 41		1,116 75			1,116 75		101 37			101 37
Tennessee, western district																
Texas, northern district			48 88			48 88							120 25			120 25
Texas, eastern district								245 34			245 34				50 00	50 00
Texas, western district										200 00	200 00					
Vermont					3,000 00	3,000 00			100 00		100 00					
Virginia, eastern district								111 99			111 99	9 83				9 83
Virginia, western district								145 00			145 00					
West Virginia		248 34				248, 34										
Wisconsin, eastern district													500 00			500 00
Wisconsin, western district																
Arizona																
Dakota															52 77	52 77
District of Columbia										4,652 32	4,652 32					
Idaho																
Montana																
New Mexico																
Utah																
Washington																
Wyoming																
Total	300 00	4,500 59	433 97	50 00	3,410 58	8,695 14	3,049 52	31,960 41	5,374 03	41,798 01	82,181 97	24,396 37	120,189 92	6,856 67	4,370 95	155,813 91

EXHIBIT D.—*Statement showing the number of civil suits to which the United States was not a party commenced and terminated in the circuit and district courts of the United States during the fiscal year ending June* 30, 1884, *with the number pending July* 1, 1884.

Districts.	Number commenced during the fiscal year ending June 30, 1884.			Number terminated during the fiscal year ending June 30, 1884.								Number pending July 1, 1884.		
				Admiralty.				Other suits.						
	Admiralty.	Other suits.	Total.	Judgments for plaintiff.	Judgments for defendant.	Dismissed or discontinued.	Total.	Judgments for plaintiff.	Judgments for defendant.	Dismissed or discontinued.	Total.	Admiralty.	Other suits.	Total.
Alabama, northern district	.....	37	37	.....	.....	.....	.....	27	.....	7	34	.....	39	39
Alabama, middle district	.....	35	35	.....	.....	.....	.....	14	3	.....	17	.....	82	82
Alabama, southern district	21	16	37	18	.....	.....	18	10	6	....	16	4	17	21
Arkansas, eastern district	5	380	385	1	2	1	4	119	34	10	163	1	217	218
Arkansas, western district	.....	72	72	.....	.....	.....	.....	40	17	.....	57	.....	105	105
California	45	226	271	6	13	.....	19	99	104	.....	203	89	249	338
Colorado	.....	315	315	.....	.....	.....	.....	134	48	157	339	.....	419	419
Connecticut	5	65	70	4	.....	1	5	20	13	20	53	7	373	380
Delaware	5	7	12	.....	5	.....	5	2	3	.....	5	5	28	33
Florida, northern district	6	85	91	3	.....	.....	3	41	.....	22	63	1	77	78
Florida, southern district	50	.....	50	54	.....	.....	54	....	.....	....	.....	4	.....	4
Georgia, northern district	.....	64	64	.....	.....	.....	.....	25	6	29	60	.....	90	90
Georgia, southern district	11	54	65	12	5	.....	17	28	29	.....	57	6	120	126
Illinois, northern district	55	487	542	22	31	.....	53	159	312	.....	471	220	1,694	1,914
Illinois, southern district	10	250	260	.....	.....	10	10	228	21	147	396	6	400	406
Indiana	7	179	186	3	.....	.....	3	76	25	62	163	4	183	187
Iowa, northern district	3	175	178	1	.....	.....	1	88	29	25	142	.....	220	220
Iowa, southern district	.....	204	204	1	.....	.....	1	80	66	37	183	2	660	662
Kansas	.....	429	429	.....	.....	.....	.....	252	28	.....	280	.....	564	564
Kentucky	8	23	31	2	1	.....	3	18	12	6	36	7	63	70
Louisiana, eastern district	121	298	419	73	29	.....	102	136	12	.....	148	601	528	1,129
Louisiana, western district	5	35	40	1	.....	.....	1	10	3	.....	13	6	31	37
Maine	24	61	85	14	6	.....	20	9	14	6	29	7	151	158
Maryland	127	81	208	25	57	.....	82	10	6	.....	16	58	104	162
Massachusetts	76	275	351	32	49	.....	81	73	36	88	197	172	1,662	1,834
Michigan, eastern district	277	238	515	165	40	.....	205	81	45	.....	126	825	.....	825
Michigan, western district	59	149	208	17	26	.....	43	72	88	.....	160	29	897	926
Minnesota	1	277	278	.....	1	.....	1	91	30	30	151	.....	380	380
Mississippi, northern district	.....	100	100	.....	.....	.....	.....	73	24	.....	97	.....	99	99
Mississippi, southern district	16	129	145	4	3	.....	7	57	37	.....	94	6	31	137

Missouri, eastern district	43	149	192	63	.....	6	69	74	65	.....	139	4	155	159
Missouri, western district	5	270	275	.....	.....	3	3	81	25	154	260	2	393	395
Nebraska	2	278	280	.....	.....	.....	.....	145	117	.....	262	5	298	303
Nevada	.....	20	20	.....	.....	.....	.....	5	3	8	16	.....	40	40
New Hampshire	.....	21	21	.....	.....	.....	.....	1	5	.....	6	.....	67	67
New Jersey	150	105	255	36	5	75	116	14	8	40	62	63	428	491
New York, northern district	122	234	356	31	2	39	72	77	9	51	137	116	4,645	4,761
New York, southern district	462	450	912	18	6	143	167	50	30	149	229	632	5,449	6,081
New York, eastern district	369	218	587	11	10	132	153	4	9	44	57	851	632	1,483
North Carolina, eastern district	8	15	23	1	1	.....	2	4	8	.....	12	6	35	41
North Carolina, western district	.....	13	13	.....	.....	.....	.....	10	5	.....	15	.....	15	15
Ohio, northern district	25	136	161	10	.....	10	20	22	2	57	81	26	463	489
Ohio, southern district	15	221	236	4	9	.....	13	44	62	.....	106	18	620	638
Oregon	18	106	124	3	5	4	12	30	12	54	96	9	297	306
Pennsylvania, eastern district	72	304	376	28	9	51	88	61	28	196	285	53	829	882
Pennsylvania, western district	42	146	188	13	5	16	34	177	27	1	205	49	201	250
Rhode Island	.....	24	24	13	.....	.....	13	13	3	.....	16	3	122	125
South Carolina	18	30	48	11	.....	2	13	20	13	.....	33	8	41	49
Tennessee, eastern district	.....	58	58	.....	.....	.....	.....	13	30	.....	43	.....	60	60
Tennessee, middle district	7	41	48	16	4	.....	20	21	19	.....	40	3	36	39
Tennessee, western district	3	38	41	1	5	.....	6	56	5	.....	61	28	85	113
Texas, northern district	.....	273	273	.....	.....	.....	.....	127	16	83	226	.....	243	243
Texas, eastern district	10	78	88	9	10	.....	19	34	25	.....	59	9	165	174
Texas, western district	4	64	68	4	.....	.....	4	23	42	.....	65	.....	65	65
Vermont	.....	18	18	.....	.....	.....	.....	8	2	12	22	.....	71	71
Virginia, eastern district	39	36	75	29	3	.....	32	12	9	.....	21	7	54	61
Virginia, western district	.....	28	28	.....	.....	.....	.....	8	8	.....	16	.....	196	196
West Virginia	4	53	57	5	.....	.....	5	24	14	2	40	15	420	435
Wisconsin, eastern district	23	134	157	11	.....	16	27	60	14	109	183	22	349	371
Wisconsin, western district	.....	81	81	.....	.....	.....	.....	26	6	23	55	.....	.....	.....
Arizona	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dakota	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
District of Columbia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Idaho	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Montana	.....	2	2	.....	.....	.....	.....	1	2	.....	3	.....	.....	.....
New Mexico	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Utah	.....	658	658	.....	.....	.....	.....	290	41	22	353	.....	178	178
Washington	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wyoming	.....	274	274	.....	.....	.....	.....	99	40	.....	139	.....	148	148
Total	2,378	9,322	11,700	775	342	509	1,626	3,706	1,755	1,651	7,112	3,989	26,383	30,372

EXHIBIT D (SUPPLEMENT).—*Statement of the amounts of judgments in civil suits, to which the United States was not a party, in the circuit and district courts of the United States during the fiscal year ending June* 30, 1884.

Districts.	Amount of judgments for plaintiff.			Amount of judgments for defendant.		
	Admiralty.	Other suits.	Total.	Admiralty.	Other suits.	Total.
Alabama, northern district.	.....	$18,435 99	$18,435 99	.....	.....	.....
Alabama, middle district...	.....	40,876 11	40,876 11	.....	$508 00	$508 00
Alabama, southern district.	$10,545 56	23,536 03	34,081 59	.....	.....	.....
Arkansas, eastern district..	44 00	361,100 00	361,144 00	.....	.....	.....
Arkansas, western district.	.....	27,751 59	27,751 59	.....	.....	.....
California.....	7,387 78	702,905 61	710,293 39	.....	.....	.....
Colorado.....	.....	378,764 97	378,764 97	.....	1,100 00	1,100 00
Connecticut	1,900 00	19,581 91	21,481 91	.....	2,947 21	2,947 21
Delaware	.....	831,984 00	831,984 00	.....	.....	.....
Florida, northern district ..	668 90	104,421 98	105,090 88	.....	.....	.....
Florida, southern district ..	53,757 30	.....	53,757 30	.....	.....	.....
Georgia, northern district..	.....	68,984 63	68,984 63	.....	391 56	391 56
Georgia, southern district..	18,152 33	92,456 81	110,609 14	$598 72	471 06	1,069 78
Illinois, northern district ..	46,413 44	995,664 44	1,042,077 88	.....	11,313 78	11,313 78
Illinois, southern district ..	.....	444,800 00	444,800 00	.....	.....	.....
Indiana	791 95	1,716,115 66	1,716,907 61	.....	1,014 00	1,014 00
Iowa, northern district	.....	132,349 66	132,349 66	.....	2,576 96	2,576 96
Iowa, southern district	1,018 70	278,936 99	279,955 69	.....	.....	.....
Kansas	.....	9,541,434 12	9,541,434 12	.....	820 00	820 00
Kentucky	14,821 00	45,350 00	60,171 00	.....	.....	.....
Louisiana, eastern district .	51,491 18	586,177 82	637,669 00	40,603 01	.....	40,603 01
Louisiana, western district.	100 00	15,693 57	15,793 57	.....	150 00	150 00
Maine	4,327 29	18,231 02	22,558 31	.....	1,493 68	1,493 68
Maryland	17,546 69	20,960 63	38,507 32	.....	.....	.....
Massachusetts	72,337 00	112,232 88	184,569 88	402 50	1,200 00	1,602 50
Michigan, eastern district..	64,619 43	232,652 58	297,272 01	.....	.....	.....
Michigan, western district.	1,056 71	196,309 73	197,366 44	.....	362 47	362 47
Minnesota	.....	205,000 00	205,000 00	.....	38,000 00	38,000 00
Mississippi, northern dist..	.....	583,294 52	583,294 52	.....	.....	.....
Mississippi, southern dist..	2,330 68	173,439 80	175,770 48	8,439 00	4,399 22	12,838 22
Missouri, eastern district ..	21,354 13	345,829 40	367,183 53	.....	.....	.....
Missouri, western district..	.....	775,204 31	775,204 31	.....	478,016 12	478,016 12
Nebraska	.....	458,836 16	458,836 16	.....	3,810 00	3,810 00
Nevada	.....	731,430 60	731,430 60	.....	.....	.....
New Hampshire	.....	10,000 00	10,000 00	.....	.....	.....
New Jersey	15,893 29	76,785 71	92,679 00	.....	32 30	32 30
New York, northern dist...	43,784 18	260,393 18	304,177 36	792 28	2,051 55	2,843 83
New York, southern dist ..	70,968 98	1,882,021 94	1,952,990 92	718 05	138,019 88	138,737 93
New York, eastern district.	63,324 28	6,600 92	69,925 20	2,976 87	882 43	3,859 30
North Carolina, east'n dist .	439 50	4,440 60	4,880 10	100 95	1,786 69	1,887 64
North Carolina, west'n dist.	.....	3,787 59	3,787 59	.....	143 33	143 33
Ohio, northern district.....	13,365 89	25,541 59	38,907 48	.....	2,300 00	2,300 00
Ohio, southern district.....	20,358 03	97,941 41	118,299 44	.....	3,438 51	3,438 51
Oregon	3,034 59	70,801 24	73,835 83	327 96	621 03	948 99
Pennsylvania, eastern dist .	17,916 36	148,791 16	166,707 52	.....	.....	.....
Pennsylvania, west'n dist..	37,150 94	255,163 50	292,314 44	.....	2,000 00	2,000 00
Rhode Island	23,701 17	43,023 99	66,725 16	.....	396 20	396 20
South Carolina.....	8,991 73	30,150 06	39,141 79	.....	.....	.....
Tennessee, eastern district	.....	68,004 09	68,004 09	.....	2,247 71	2,247 71
Tennessee, middle district .	3,040 81	117,095 80	120,136 61	53 15	932 09	985 24
Tennessee, western district	71 50	113,000 00	113,071 50	.....	.....	.....
Texas, northern district....	.....	174,342 55	174,342 55	.....	.....	.....
Texas, eastern district.....	18,309 68	48,617 89	66,927 57	.....	.....	.....
Texas, western district	480 00	44,000 00	44,480 00	.....	.....	.....
Vermont.....	.....	28,348 00	28,348 00	.....	154 40	154 40
Virginia, eastern district...	10,512 00	2,265 50	12,777 50	.....	.....	.....
Virginia, western district..	.....	8,901 48	8,901 48	.....	29 50	29 50
West Virginia	3,246 58	61,334 51	64,581 09	.....	180 65	180 65
Wisconsin, eastern district	4,726 99	46,857 64	51,584 63	.....	517 21	517 21
Wisconsin, western district	.....	41,443 00	41,443 00	.....	500 00	500 00
Arizona.....	.....	.....	.....	.....	.....	.....
Dakota	.....	.....	.....	.....	.....	.....
District of Columbia.....	.....	.....	.....	.....	.....	.....
Idaho	.....	.....	.....	.....	.....	.....
Montana.....	.....	.....	.....	.....	.....	.....
New Mexico.....	.....	.....	.....	.....	.....	.....
Utah	.....	523,974 29	523,974 29	.....	192,734 00	192,734 00
Washington	.....	.....	.....	.....	.....	.....
Wyoming.....	.....	29,844 07	29,844 07	.....	1,544 05	1,544 05
Total	749,980 57	24,504,215 23	25,254,195 80	55,012 49	899,085 59	954,098 08

EXHIBIT E.—*Tabular statement of causes heretofore disposed of, and also of those now pending in the Court of Claims.*

Calendar year.	Number of suits brought in each year.			Number of suits closed by report* or judgment† each year.					Suits pending of the number brought in each year aforesaid.		Recovery by United States on counter-claims.
	No. of suits.	Amount claimed.	No. of cases in which amount is not stated in petition.	No. for claimants.	Amount claimed.	Amount of recovery.	No. for defendants.	Amount claimed.	No. of suits pending.	Amount claimed.	
1855	464	$5,910,801 84	142	.....	.....	.....	.....	.....	.....	.....	.....
1856	320	3,944,813 15	76	25	$370,301 99	$312,324 54	20	$167,314 86	.....	.....	.....
1857	823	3,499,058 55	31	58	254,177 20	144,924 02	49	1,180,239 94	.....	.....	.....
1858	173	1,382,158 05	83	5	179,982 73	46,858 22	31	547,001 70	.....	.....	.....
1859	40	958,867 11	21	8	76,386 13	35,539 36	53	2,187,535 86	.....	.....	.....
1860	35	953,480 63	16	10	401,541 37	89,821 04	26	302,113 71	.....	.....	.....
1861	7	380,970 92	4	4	11,168 75	8,369 00	9	195,961 96	.....	.....	.....
1862	17	110,381 75	5	6	159,324 45	48,302 05	.....	.....	.....	.....	.....
1863	114	2,103,503 43	2	1	(‡)	(§)	406	3,081,662 78	.....	.....	.....
1864	154	1,614,914 37	13	5	180,801 60	73,402 32	330	4,041,952 45	.....	.....	.....
1865	46	1,347,540 17	2	8	245,885 28	126,704 14	23	630,860 76	.....	.....	.....
1866	361	6,593,772 77	234	18	247,218 74	133,960 90	206	2,146,404 13	.....	.....	.....
1867	488	13,086,344 14	1	50	2,005,951 94	872,863 01	114	1,288,092 75	.....	.....	.....
1868	745	27,938,800 48	10	98	1,466,883 07	782,620 40	24	591,630 45	.....	.....	.....
1869	2,344	6,794,619 64	6	49	1,411,570 31	855,326 21	72	1,070,004 69	.....	.....	.....
1870	161	4,055,730 42	46	114	1,568,154 57	1,035,152 43	53	2,241,739 04	.....	.....	$1,647 58
1871	114	3,269,867 96	1	65	1,578,968 13	1,161,615 53	36	968,931 63	.....	.....	.....
1872	450	8,981,125 45	2	132	2,831,172 55	2,028,865 50	17	461,429 21	.....	.....	.....
1873	1,125	5,090,165 51	2	1,528	5,775,255 42	3,627,957 21	30	696,283 32	.....	.....	.....
1874	2,180	30,849,722 12	14	731	1,645,580 81	908,622 30	65	1,119,713 10	.....	.....	.....
1875	738	3,971,371 59	30	234	4,035,542 57	2,949,136 09	59	2,850,959 23	3	$1,095,890 00	.....
1876	592	3,302,910 55	9	27	1,524,476 29	1,126,726 10	2,431	13,783,158 91	3	415,146 08	4,419 39
1877	397	8,015,936 99	1	32	472,561 84	203,710 14	438	10,461,033 18	6	191,806 13	6,106 53
1878	102	4,339,622 11	.....	65	324,147 75	189,697 92	2,497	39,625,379 94	6	2,611,633 37	.....
1879	164	2,313,318 49	.....	41	1,217,134 43	412,163 19	156	13,763,582 69	5	1,467,667 60	618,627 73
1880	256	839,702 64	.....	190	935,346 11	331,742 89	1,305	2,340,122 95	12	49,895 24	.....
1881	418	17,773,362 73	1	51	1,721,283 12	854,354 50	166	4,241,011 39	30	17,099,141 42	.....
1882	584	1,445,819 83	234	31	370,345 14	178,016 48	376	3,754,377 17	464	529,099 14	.....
1883	813	10,099,967 63	44	32	881,015 44	468,998 13	224	3,017,721 82	728	6,874,661 54	.....
1884	286	7,844,611 89	11	65	722,630 22	217,331 88	79	2,266,977 75	276	7,838,175 41	29,002 11
Total	14,511	188,813 262 91	1,041	3,683	32,614,807 95	19,225,105 50	9,295	119,023,196 37	1,533	38,173,115 93	659,803 34

*The act organizing the Court of Claims was passed February 4, 1855 (10 Stat., 612), by which the court was directed to hear and determine claims and report the cases and facts to Congress, with their opinion. †On the 3d of November, 1863 (12 Stat., 765), the said act was amended, and the courts authorized to render final judgments, with right of appeal to the Supreme Court of the United States. ‡No amount claimed. §Judgment for land scrip.

EXHIBIT F.—*General statement of all the appropriations placed under the Department of Justice which were available, and those from which payments were made, during the fiscal year ending June 30, 1884, as required by section 3, act approved June 30, 1879.*

Balance of reappropriation, expenses of United States courts, 1879 and prior years:		
Balance July 1, 1883	$41,561 87	
Repayments during fiscal year	6,366 36	
	47,928 23	
Payments during fiscal year	7,402 20	
Balance July 1, 1884		$40,526 03
Salaries of district marshals, 1880 and prior years:		
Balance July 1, 1883	990 45	
Balance July 1, 1884		990 45
Balance of appropriation, expenses of Territorial courts in Utah, 1880 and prior years:		
Balance July 1, 1883	$12 00	
Payments during fiscal year	12 00	
Balance of appropriation, fees of supervisors of elections, prior to July 1, 1880:		
Balance July 1, 1883	$50 00	
Balance July 1, 1884		50 00
Balance of reappropriation, fees and expenses of marshals, United States courts, 1880:		
Balance July 1, 1883	$14,274 00	
Payments during fiscal year	383 97	
Balance July 1, 1884		13,890 03
Balance of reappropriation, fees of district attorneys, United States courts, 1880:		
Balance July 1, 1883	$5,395 27	
Balance July 1, 1884		5,395 27
Balance of reappropriation, fees of clerks, United States courts, 1880:		
Balance July 1, 1883	$7,788 73	
Balance July 1, 1884		7,788 73
Balance of reappropriation, fees of commissioners, United States courts, 1880:		
Balance July 1, 1883	$9 75	
Balance July 1, 1884		9 75
Balance of reappropriation, fees of jurors, United States courts, 1880:		
Balance July 1, 1883	$742 35	
Payments during fiscal year	300 00	
Balance July 1, 1884		442 35
Balance of reappropriation, fees of witnesses, United States courts, 1880:		
Balance July 1, 1883	$371 10	
Balance July 1, 1884		371 10
Balance of reappropriation, support of prisoners, United States courts, 1880:		
Balance July 1, 1883	$1,093 00	
Balance July 1, 1884		1,093 00

Balance of appropriation, rent of court-rooms, United States courts, 1880:		
Balance July 1, 1883	$360 00	
Payments during fiscal year	60 00	
Balance July 1, 1884		$300 00
Balance of reappropriation, miscellaneous expenses, United States courts, 1880:		
Balance July 1, 1883	$615 99	
Payments during fiscal year	157 91	
Balance July 1, 1884		458 08
Balance of appropriation, expenses United States courts in Utah, 1880:		
Balance July 1, 1883	$1,517 61	
To surplus fund, June 30, 1884		1,517 61
Fees and expenses of marshals, United States courts, 1881 and prior years:		
Repayments during fiscal year	$645 82	
To surplus fund, June 30, 1884		645 82
Fees of witnesses, United States courts, 1881 and prior years:		
Repayments during fiscal year	$194 25	
To surplus fund, June 30, 1884		194 25
Support of prisoners, United States courts, 1881 and prior years:		
Repayments during fiscal year	$1,697 00	
To surplus fund, June 30, 1884		1,697 00
Miscellaneous expenses, United States courts, 1881 and prior years:		
Repayments during fiscal year	$77 25	
To surplus fund, June 30, 1884		77 25
Balance of appropriation, fees and expenses of marshals, United States courts, 1881:		
Balance July 1, 1883	$13,280 86	
Payments during fiscal year	1,512 52	
Balance July 1, 1884		11,768 34
Balance of appropriation, fees of clerks, United States courts, 1881:		
Balance July 1, 1883	$7,814 50	
Balance July 1, 1884		7,814 50
Balance of reappropriation, expenses of Territorial courts in Utah, 1881:		
Balance July 1, 1883	$1,077 32	
Balance July 1, 1884		1,077 32
Balance of appropriation, law library, Wyoming Territory:		
Balance July 1, 1883	$24 00	
Balance July 1, 1884		24 00
Balance of appropriation, payment of special deputy marshals at Congressional elections, 1881 and prior years:		
Balance July 1, 1883	$2,145 50	
Repayments during fiscal year	4,658 00	
	6,803 50	
Payments during fiscal year	90 00	
Balance July 1, 1884		6,713 50

Balance of appropriation, fees and expenses of marshals, United States, courts, 1882:		
Balance July 1, 1883	$31,147 45	
Repayments during fiscal year	6,867 71	
	38,015 16	
Payments during fiscal year	12,947 70	
Balance July 1, 1884		$25,067 46
Balance of appropriation, fees of clerks, United States courts, 1882:		
Balance July 1, 1883	$20,535 00	
Payments during fiscal year	372 40	
Balance July 1, 1884		20,162 60
Balance of appropriation, fees of commissioners, United States courts, 1882:		
Balance July 1, 1883	$34,961 57	
Payments during fiscal year	864 95	
Balance July 1, 1884		34,096 62
Balance of appropriation, fees of jurors, United States courts, 1882:		
Balance July 1, 1883	$67,085 27	
Repayments during fiscal year	528 57	
	67,613 84	
Payments during fiscal year	604 00	
Balance July 1, 1884		67,009 84
Balance of appropriation, fees of witnesses, United States courts, 1882:		
Balance July 1, 1883	$58,937 45	
Repayments during fiscal year	4,229 04	
	63,166 49	
Payments during fiscal year	1,427 01	
Balance July 1, 1884		61,739 48
Balance of appropriation, support of prisoners, United States courts, 1882:		
Balance July 1, 1883	$62,244 24	
Repayments during fiscal year	3,424 31	
	65,668 55	
Payments during fiscal year	4,454 88	
Balance to surplus fund, June 30, 1884		61,213 67
Balance of appropriation, rent of court-rooms, United States courts, 1882:		
Balance July 1, 1883	$20,803 40	
Payments during fiscal year	1,404 00	
Balance to surplus fund, June 30, 1884		19,399 40
Balance of appropriation, miscellaneous expenses, United States courts, 1882:		
Balance July 1, 1883	$10,254 24	
Repayments during fiscal year	1,571 97	
	11,826 21	
Payments during fiscal year	2,731 49	
Balance to surplus fund, June 30, 1884		9,094 72

Balance of appropriation, salaries, Department of Justice, 1882:		
Balance July 1, 1883	$5,229 74	
Balance to surplus fund, June 30, 1884		$5,229 74
Balance of appropriation, prosecution of crimes, 1882:		
Balance July 1, 1883	$1,981 33	
Balance to surplus fund, June 30, 1884		1,981 33
Balance of appropriation, defending suits in claims against the United States, 1882:		
Balance July 1, 1883	$5,967 24	
Balance to surplus fund, June 30, 1884		5,967 24
Balance of appropriation, support of convicts, 1882:		
Balance July 1, 1883	$21,198 76	
Payments during fiscal year	146 00	
Balance to surplus fund, June 30, 1884		21,052 76
Balance of appropriation, punishing violations of intercourse acts and frauds, 1882:		
Balance July 1, 1883	$1,804 81	
Balance to surplus fund, June 30, 1884		1,804 81
Balance of appropriation, expenses of Territorial courts in Utah, 1882:		
Balance July 1, 1883	$3,575 15	
Payments during fiscal year	814 95	
Balance to surplus fund, June 30, 1884		2,760 20
Balance of appropriation, rent of building, Department of Justice, 1882:		
Balance July 1, 1883	$989 00	
Balance to surplus fund, June 30, 1884		989 00
Balance of appropriation, preservation of records, United States courts, Frankfort, Ky., 1882:		
Balance July 1, 1883	$144 00	
Balance to surplus fund, June 30, 1884		144 00
Balance of appropriation, publishing supreme court report, Territory of Wyoming, 1882:		
Balance July 1, 1883	$1,000 00	
Payments during fiscal year	819 17	
Balance to surplus fund, June 30, 1884		180 83
Contingent expenses, Department of Justice, 1882, viz, balance of appropriation, furniture and repairs, 1882:		
Balance July 1, 1883	$12 67	
Balance to surplus fund, June 30, 1884		12 67
Balance of appropriation, stationery, 1882:		
Balance July 1, 1883	0 32	
Balance to surplus fund, June 30, 1884		32
Balance of appropriation, horses and wagons, 1882:		
Balance July 1, 1883	163 36	
Balance to surplus fund, June 30, 1884		163 36

Balance of reappropriation, miscellaneous items, 1882:		
Balance July 1, 1883	$178 06	
Balance to surplus fund, June 30, 1884		$178 06
Balance of appropriation, fees and expenses of marshals, United States courts, 1883:		
Balance July 1, 1883	$60,472 85	
Repayments during fiscal year	22,308 77	
	82,781 62	
Payments during fiscal year	43,827 24	
Balance July 1, 1884		38,954 38
Balance of appropriation, fees of district attorneys, United States courts, 1883:		
Balance July 1, 1883	$159 59	
Payments during fiscal year	147 38	
Balance July 1, 1884		12 21
Balance of appropriation, fees of clerks, United States courts, 1883:		
Balance July 1, 1883	$14,860 84	
Repayments during fiscal year	21 30	
	14,882 14	
Payments during fiscal year	14,876 85	
Balance July 1, 1884		5 29
Balance of appropriation, fees of commissioners, United States courts, 1883:		
Balance July 1, 1883	$27,951 28	
Payments during fiscal year	27,950 93	
Balance July 1, 1884		35
Balance of appropriation, fees of jurors, United States courts, 1883:		
Balance, July 1, 1883	$2.867 55	
Repayments during fiscal year	47,643 33	
	50,510 88	
Payments during fiscal year	17,832 15	
Balance July 1, 1884		32,678 73
Balance of appropriation, fees of witnesses, United States courts, 1883:		
Balance July 1, 1883	$4,145 02	
Repayments during fiscal year	47,355 19	
	51,500 21	
Payments during fiscal year	39,766 83	
Balance July 1, 1884		11,733 38
Balance of appropriation, support of prisoners, United States courts, 18-3:		
Balance July 1, 1883	$89,229 56	
Repayments during fiscal year	21,134 93	
	110,364 49	
Payments during fiscal year	33,072 21	
Balance July 1, 1884		77,292 28
Balance of appropriation, rent of court-rooms, United States courts, 1883:		
Balance July 1, 1883	$32,221 32	
Payments during fiscal year	16,472 43	
Balance July 1, 1884		15,748 89

Balance of appropriation, miscellaneous expenses, United States courts, 1883:		
Balance July 1, 1883	$7,710 01	
Repayments during fiscal year	13,074 27	
	20,784 28	
Payments during fiscal year	18,884 64	
Balance July 1, 1884		$1,899 64
Balance of appropriation, salaries of employés, court-house, Washington, D. C., 1883:		
Balance July 1, 1883	$222 67	
Balance July 1, 1884		222 67
Balance of appropriation, prosecution of crimes, 1883:		
Balance July 1, 1883	1,904 73	
Payments during fiscal year	1,904 73	
Balance of appropriation, defending suits in claims against the United States, 1883:		
Balance July 1, 1883	$5,770 01	
Balance July 1, 1884		5.770 01
Balance of appropriation, support of convicts, 1883:		
Balance July 1, 1883	$10,201 24	
Payments during fiscal year	713 14	
Balance July 1, 1884		9,488 10
Balance of appropriation, punishing violations of intercourse acts and frauds, 1883:		
Balance July 1, 1883	$2,640 85	
Repayments during fiscal year	187 45	
	2,828 30	
Payments during fiscal year	721 68	
Balance July 1, 1884		2,106 62
Balance of appropriation, prosecution and collection of claims, 1883:		
Balance July 1, 1883	$639 25	
Payments during fiscal year	15 00	
Balance July 1, 1884		624 25
Balance of appropriation, expenses of Territorial courts in Utah, 1883:		
Balance July 1, 1883	$3,907 55	
Payments during fiscal year	1,072 45	
Balance July 1, 1884		2,835 10
Balance of appropriation, judgment and costs in suit of L. P. Milligan:		
Balance July 1, 1883	$802 16	
Balance July 1, 1884		802 61
Fees and expenses of marshals, United States courts, 1884:		
Appropriation, act of March 3, 1883	$600,000 00	
Repayments during fiscal year	2,062 22	
	602,062 22	
Payments during fiscal year	601,435 67	
Balance July 1, 1884		626 55

Fees of district attorneys, United States courts, 1884:		
Appropriation, act of March 3, 1883	$325 000 00	
Payments during fiscal year	311,242,49	
Balance July 1, 1884		$13,757 51
Fees of clerks, United States courts, 1884:		
Appropriation, act of March 3, 1883	160,000 00	
Payments during fiscal year	127,207 12	
Balance July 1, 1884		32,792 88
Fees of commissioners, United States courts, 1884:		
Appropriation, act of March 3, 1883	130,000 00	
Payments during fiscal year	92,049 06	
Balance July 1, 1884		37,950 94
Fees of jurors, United States courts, 1884:		
Appropriation, act of March 3, 1883	450,000 00	
Repayments during fiscal year	6,702 25	
	456,702 25	
Payments during fiscal year	456,690 00	
Balance July 1, 1884		12 25
Fees of witnesses, United States courts, 1884:		
Appropriation, act of March 3, 1883	600,000 00	
Repayments during fiscal year	9,874 33	
	609,874 33	
Payments during fiscal year	609,599 65	
Balance July 1, 1884		274 68
Support of prisoners, United States courts, 1884:		
Appropriation, act of March 3, 1883	300,000 00	
Repayments during fiscal year	6,541 03	
	306,541 03	
Payments during fiscal year	232,255 69	
Balance July 1, 1884		74,285 34
Rent of court-rooms, United States courts, 1884:		
Appropriation, act of March 3, 1883	50,000 00	
Payments during fiscal year	37,149 20	
Balance July 1, 1884		12,850 80
Miscellaneous expenses, United States courts, 1884:		
Appropriation, act of March 3, 1883	310,000 00	
Repayments during fiscal year	2,312 79	
	312,312 79	
Payments during fiscal year	294,605 48	
Balance July 1, 1884		17,707 31
Salaries, Department of Justice, 1884:		
Appropriation, act of March 3, 1883	138,450 00	
Payments during fiscal year	136,448 02	
Balance July 1, 1884		2,001 98
Salaries of employés, court-house, Washington, D. C., 1884:		
Appropriation, act of March 3, 1883	$9,840 00	
Payments during fiscal year	9,810 00	
Balance July 1, 1884		30 00

Salary of warden of jail, District of Columbia, 1884:		
Appropriation, act of March 3, 1883	$1,800 00	
Payments during fiscal year	1,800 00	
Prosecution of crimes, 1884:		
Appropriation, act of March 3, 1883	25,000 00	
Payments during fiscal year	21,665 90	
Balance July 1, 1884		$3,334 10
Defending suits in claims against the United States, 1884:		
Appropriation, act of March 3, 1883	9,000 00	
Payments during fiscal year	6,422 30	
Balance July 1, 1884		2,577 70
Repairs to court-house, Washington, D. C., 1884:		
Appropriation, act of March 3, 1883	1,000 00	
Payments during fiscal year	950 00	
Balance July 1, 1884		50 00
Support of convicts, 1884:		
Appropriation, act of March 3, 1883	10,000 00	
Payments during fiscal year	1,439 25	
Balance July 1, 1884		8,560 75
Punishing violations of intercourse acts and frauds, 1884:		
Appropriation, act of March 3, 1883	5,000 00	
Payments during fiscal year	4,085 65	
Balance July 1, 1884		914 35
Prosecution and collection of claims, 1884:		
Appropriation, act of March 3, 1883	1,500 00	
Balance July 1, 1884		1,500 00
Expenses of Territorial courts in Utah, 1884:		
Appropriation, act of March 3, 1883	26,000 00	
Payments during fiscal year	24,072 15	
Balance July 1, 1884		1,927 85
Payment to Henry Fink, United States marshal:		
Appropriation, act of March 3, 1883	108 80	
Payment during fiscal year	108 80	
Contingent expenses, Department of Justice, viz, furniture and repairs, 1884:		
Appropriation, act of March 3, 1883	$1,000 00	
Payments during fiscal year	750 00	
Balance July 1, 1884		250 00
Books for Department library, 1884:		
Appropriation, act of March 3, 1883	1,500 00	
Payments during fiscal year	1,500 00	
Books for office of Solicitor, 1884:		
Appropriation, act of March 3, 1883	500 00	
Payments during the fiscal year	500 00	
Stationery, 1884:		
Appropriation, act of March 3, 1883	1,500 00	
Payments during fiscal year	1,500 00	

Horses and wagons, 1884:	
Appropriation, act of March 3, 1883	$1,200 00
Payments during fiscal year	1,200 00
Miscellaneous items, 1884:	
Appropriation, act of March 3, 1883	7,160 00
Payments during fiscal year	7,160 00

EXHIBIT G.—*Statement showing items, amounts, cause of expenditures, and persons paid from contingent fund for the fiscal year ending June* 30, 1884.

MISCELLANEOUS ITEMS.

1883.	L. C. Bishop:		
July 1.	For 100 reams W. C. paper	$15 00	
	For 100 pounds sulphate of iron, at 10 cents	10 00	
	For 2 dozen bottles carbolic acid	6 00	
	For 1 gross matches	3 60	
2.	For 1 dozen kid chamois skins	18 00	
			$52 60
	Charles A. Bruff:		
	For supplying and putting on 1 transom rod	1 75	
	For 1 brass catch and repairing washstand	75	
	For 2 springs and repairing chair	2 00	
	For 1 brass catch and repairing washstand door and case door	2 00	
	For repairing 1 table	50	
	For supplying and putting on 1 transom rod and pin	1 80	
	For repairing case door, supplying and putting on 6 wooden escutcheons	50	
	For repairing 2 desks, easing drawers, repairing locks, and fitting two keys	2 25	
	For repairing wardrobe locks	25	
	For repairing and putting knobs on w. c. door	90	
3.	For supplying hinges and rehanging wardrobe door	1 50	
	For repairing case	25	
	For repairing desk and easing drawers	1 50	
	For supplying 2 brass-socket casters and putting on chair	75	
5.	For supplying and putting in 21 sash-cords, at 50 cents	10 50	
	For supplying and putting on 5 sash locks and supplying cord for 4 awnings	2 00	
	For one-half dozen hooks and putting up hat and coat rack	1 95	
	For 1 Yale lock and putting on drawer	2 00	
	W. D. Wyvill:		
2.	For 1 green shade, 75 cents; 1 chimney for student's lamp, 15 cents	90	
	For 6 cotton mops and handles, at 50 cents	3 00	
	For 50 feet 1-inch extra standard hose, at 30 cents	15 00	
	For 1 pair brass couplings, 75 cents; 1 stop-cock key, $1	1 75	
5.	For 12 large iron spittoons for second and third floors, at $2	24 00	
	For 3 speaking-tube whistle mouth-pieces, at 50 cents	1 50	
	For 1 large ice-water cooler	9 50	
	For 1 large ice-water cooler stand	2 75	
7.	For 1 Grant's water filter	2 25	
	For 5 gallons lard oil, at $1.10	5 50	
9.	For 10 pounds Albany grease, at 40 cents	4 00	
	For 2 20-inch feather dusters, at $2.50; 1 dust brush, $1	6 00	
	For 1 covered dust pan, 35 cents; 2¾ pounds brass wire, $1.38	1 73	
	For 1 pair cutting plyers, $1; 1 screw plate, $4.50	5 50	
	For 5 gallons vaseline lubricating oil, at $1.75	8 75	
			92 13

1883.		William O. Saville:		
July	6.	For railway fare from Baltimore to Washington and return, via Baltimore and Ohio Railroad, to inspect boiler in Department of Justice	$2 00	
		For street-car fare	20	
	9.	For railway fare from Baltimore to Washington and return, via Baltimore and Ohio Railroad, to complete inspection of boiler in Department of Justice	2 00	
		For street-car fare	20	
		For lunch	80	
				$5 20
		R. Bruce Bare:		
	16.	For 633 street-car tickets to be used by the messengers of the Department of Justice while traveling on official business		25 00
		Henry Neubeck:		
	10.	For making 8 keys for file cases in chief clerk's room	$2 00	
	11.	For repairing 1 Yale lock in room No. 7	1 00	
				00
		George W. Knox:		
	16.	For freight and cartage on 1 box P. tablets		1 22
		The National Republican Printing Company:		
June	30.	For subscription to Daily Republican from January 1, 1883, to June 30, 1883, inclusive, for office of Solicitor of the Treasury.		3 00
		Henry Coleman:		
Aug.	31.	For washing 18 dozen and 2 towels during the month of August, 1883, at 30 cents per dozen, for use of Department of Justice.		5 45
		Ellen Lucas:		
July	31.	For washing for use of the office of the Solicitor of the Treasury during the month of July, 1883, 9 and $\frac{8}{12}$ dozen towels, at 30 cents per dozen		2 90
		James Talty:		
		For $\frac{1}{4}$ lt. chandelier with globes, extra casing and pipe, and hanging same	$12 00	
		For 2 double-swing brackets with globes, holders, and puting up same, $2	4 00	
		For 1 silver-plated camp faucet, 1 Bower's patent trap, 6 pounds lead pipe, 3 pounds solder, brass thimble, setting wash-basin, making new connections, putting trap under basin	9 00	
				25 00
		Peter Carroll:		
		For 10 days' labor at Department of Justice building, during the month of July, 1883		10 00
		Charles A. Bruff:		
	10.	For repairing 1 chair	$1 35	
		For fitting 1 key	25	
	26.	For fitting 3 keys	1 05	
		For supplying and putting on 2 tumbler locks and 1 Yale lock	5 00	
	28.	For supplying and putting on brass hook	55	
		For making 2 letter-holders	10 00	
Aug.	2.	For repairing, recovering, varnishing, and supplying 1 set patent casters, 1 dozen knobs, and putting on desk.	17 50	
		For repairing wardrobe, and supplying and putting on 1 lock	2 50	
				38 20
		John Wells:		
July	31.	For hauling 9 loads ashes from Department of Justice building, at 30 cents		2 70
		J. J. Desmond:		
Aug.	7.	For hauling 39 loads ashes from engine-room, Department of Justice building, at 30 cents		11 70
		I. H. Chamberlin:		
	8.	For whitewashing large hall on fifth floor, water-closet and small store room, and 2 large closets on second floor		10 00

1883. Work done between the dates of July 18 and August 11.	James M. Hodges:			
	For painting in Department of Justice building as follows:			
	For 323 yards (elliptic) cleaning and painting ceilings at 23 cents		$74	29
	For 748 yards (elliptic) base, at 5 cents		37	40
	For 339 yards gilded joist, at 24 cents		81	36
	For 571⅔ yards, cleaning and painting sides, at 20 cents.		114	29
	For 253 yards cornice, at 60 cents		151	80
	For 313 yards framing and jambs, colored, at 25 cents..		78	25
	For 96 yards varnish, at 20 cents		19	20
	For 83½ yards cornice and border, at 8 cents	6 70		
		563 29		
	Measurer's bill 3 per cent. on $563.29, $16.90, one-half to bill	8 45		
			$571	74
	(Sworn measurer's certificate attached to voucher.)			
	Penrose Thomas:			
Aug. 11.	For one dozen balls silver polish for use in engine room		1	00
	R. T. Hunter:			
14.	For 4 portable fire extinguishers		200	00
	Charles A. Bruff:			
3.	For supplying and putting on 1 awning cleat	50		
15.	For supplying and putting on 1 Yale night-latch on door and making brass keeper	3 50		
	For supplying and putting on door hook and stop	65		
			4	65
	Mrs. R. Warner:			
Aug. 8. to 11.	For four days' labor, to wit, August 8, 9, 10, and 11, 1883, to scrubbing large hall floor on fifth story and stairway, Department of Justice building, at $1 per day		4	00
	Charles A. Hall:			
Aug. 15.	For three days' labor, to wit, 13th, 14th, and 15th, 1883, whitewashing in Department of Justice building		8	00
	Adams Express Company:			
July 11.	For 1 package to Hon. B. H. Brewster, Long Branch, N. J.	$0 60		
13.	For 1 box, value $5,000, from Austin, Tex., to Hon. William Lawrence	20 75		
17.	For 1 package from Philadelphia to J. R. Young, chief clerk	60		
25.	For 1 box to E. M. Seabrook, Charleston, S. C	1 90		
			23	85
	Luther Judkins:			
Aug. 24.	For hauling one load books, &c., to Government Printing Office.		1	00
	J. Maury Dove:			
July 2.	For 10 tons furnace coal, at $6.20, stowing away same, at 25 cents	$64 50		
26.	For 10 tons furnace coal, at $6.20	62 00		
	For stowing away same, at 25 cents	2 50		
			129	00
	H. B. Jordan:			
Aug. 28.	For packing valve and cylinder of elevator, Department of Justice		8	00
	Wyckoff, Seamans & Benedict:			
July 9.	For 1 traveling case for type-writer	$7 50		
13.	For 2 type-writers, with 2–4 draw desks	215 00		
	For ½ dozen bottles oil	60		
	For 2 brushes	20		
			223	30
	Charles A. Bruff:			
Aug. 15.	For supplying glass and bracket and putting the same in place	8 00		
	For repairing gate and supplying 1 catch	1 05		
	For taking down revolving book case and map case and putting up book case	3 75		
21.	For draping building	8 00		
			20	80

1883.		Ellen Lucas:		
Aug.	31.	For washing for the use of the office of the Solicitor of the Treasury during the month of August, 1883, 8 dozen towels, at 30 cents per dozen		$2 40
		Robert Leitch & Sons:		
July	28.	For 3 register gauge-cocks for steam boiler, at $1		3 00
		Henry Coleman:		
Aug.	31.	For washing 15¾ dozen towels for Department of Justice during month of August, 1883, at 30 cents		4 72
		R. Bruce Bare:		
Sept.	4.	For 633 street-car tickets for use of messengers and others of Department of Justice while traveling on official business		25 00
		Alexander Reed:		
	6.	For hauling six thousand envelopes and one package of books to Government Printing Office		1 50
		H. Crawford:		
	7.	For hauling one load books from State Department to Department of Justice		50
		L. G Bishop:		
Aug.	14.	For 1 dozen whisk brooms	$3 50	
		For 100 cakes B. B. soap	8 00	
		For ⅙ dozen hair brushes	2 70	
		For ⅙ dozen dress combs	1 20	
		For 1 gross cup sponges	7 20	
				22 60
		William H. Douglas:		
	20.	For 9 pounds brass castings, at 40 cents	3 60	
		For drilling brass castings	50	
	28.	For 1 double brass lock wrench	1 50	
Sept.	6.	For 4 1½-inch hose clamp wrenches, at 60 cents	2 40	
		For altering 2 iron stays	50	
				8 50
		Alexander Reed:		
	14.	For hauling one large load of books from Department of Justice to city post-office		2 00
		Peter Carroll:		
Aug.	31.	For ten days' labor at Department of Justice building, during the month of August, 1883		10 00
		John Schaefer:		
Sept.	20.	For repairing locks on large walnut desk in stenographer's room		1 00
		Acker & Co.:		
Aug.	7.	For 8 feet 2¼ inches glazed tile hearth in chief clerk's room, at $2.75		22 50
		W. Aitkenhead:		
Sept.	20.	For repairing stone steps in front of Department of Justice building		4 00
		M. G. Copeland & Co:		
Aug.	13.	For repairing storm-flag for Department of Justice building		2 00
		Seaton Perry:		
	20.	For 125 yards black cambric, at 8 cents		10 00
		Lewis Green:		
Sept.	26.	For 2 days' labor storing wood on second, third, and fourth floors, Department of Justice building		1 25
		The New York Herald, James G. Bennett, proprietor:		
		For one year (not including Sunday edition), from July 8, 1883, to July 8, 1884, The New York Herald		8 00
		The New York Times, George Jones, proprietor:		
		For subscription to daily for Solicitor of Treasury, Washington, D. C., from July 9, 1883, to June 30, 1884		11 75
		Wallace W. Hall:		
Aug.	1.	For telegram, Chicago, Ill., to Washington, D. C., to Hon. Kenneth Rayner, Solicitor of the Treasury		1 90

1883.		James M. Hodges:		
Aug.	31.	For plastering elevator passage-way	$35 00	
		For painting wall, floor, &c., passsage-way	50 00	
		For painting, varnishing, and bronzing in several rooms throughout building	36 00	
		For plastering various places throughout building	21 00	
				$142 00
		Henry Coleman:		
Sept.	30.	For washing towels during month of September, Department of Justice, viz, 16½ dozen towels, at 30 cents per dozen		4 82
		Peter Carroll:		
		For 10 days' labor at Department of Justice building during the month of September, 1883		10 00
		Henry Clark:		
Oct.	2.	For 2 days' labor moving furniture in rooms 6 and 8, floor A, and rooms 2, 3, and 8, floor B, Department of Justice building		$2 50
		Wesley Johnson:		
		For 2 days' labor moving furniture in rooms 6 and 8, floor A, and rooms 2, 3, and 8, floor B, Department of Justice building		2 50
		Stephen R. Sinkler:		
		For 2 days' labor moving furniture in rooms 6 and 8, floor A, and rooms 2, 3, and 8, floor B, Department of Justice building		2 50
		Washington City post-office, Frank B. Conger, postmaster:		
June	30.	For box rent, postage on letters, &c., from April 1 to June 30, 1883		1 72
		C. Schneider:		
Oct.	3.	For repairing safe lock		25
		Ellen Lucas:		
Sept.	30.	For washing for the use of the office of the Solicitor of the Treasury during the month of September, 1883, 7½ dozen towels, at 30 cents per dozen		2 25
		William Ballantyne & Son:		
Oct.	4.	For one book-stand and shelf		8 50
		Charles A. Bruff:		
Sept.	28.	For repairing 1 chair	$1 40	
		For fitting 2 keys	50	
		For repairing and caning 1 large chair	1 75	
Oct.	3.	For making 2 cases and supplying material	60 00	
		For supplying and putting on 4 Yale locks and repairing desk doors	8 70	
		For supplying 3 tumbler locks and repairing desk	3 50	
				75 85
		Washington City post-office, Frank B. Conger, postmaster:		
	5.	For 2 1-cent postage-stamps	02	
		For 126 2-cent postage-stamps	2 52	
		For 39 4-cent postage-stamps	1 56	
		For 9 10-cent postage-stamps	90	
				5 00
		W. D. Wyvill:		
	8.	For 3 new water-closets	90 00	
		For 1 urinal	10 00	
		For 1 4 by 2 cast-iron cross	1 50	
		For 2 2-inch cast-iron bends	1 00	
		For 2 lengths 2-inch cast-iron pipe	2 50	
		For 2 2-inch double hubs	1 50	
		For 1½ pounds hemp	38	
		For 1 1½ Bower's "S" trap	3 00	
		For 1 1¼ thimble	50	
		For 1 1¼ Bower's "S" trap	2 50	
		For 8½ pounds solder	2 13	
		For 1¼ pounds male fittings	50	
		For 1⅛ nipple	10	
		For 2 pounds galvanized fittings	3 50	

1883.		W. D. Wyvill—Continued:		
Oct.	8.	For 4 2-inch C. I. bends	$2 00	
		For 31½ pounds lead pipe	3 15	
		For 2 4-inch C. I. caps	1 00	
		For 1 2-inch C. I. T	50	
		For 5 pounds solder	1 25	
		For 2 1¼-inch thimbles	1 00	
		For 10 feet 2-inch C. I. pipe	2 50	
		For 1 2-inch caulk thimble	1 00	
		For 1 2 by 1¼ reducer	50	
		For 3 ½-inch nipples	30	
		For 3 ½-inch thimbles	75	
		For 1 2-inch Bower's "S" trap	4 00	
		For 1 2-inch caulk thimble	1 00	
		For chasing C. I. caps	50	
		For 1 1½ Bower's "P" trap	3 00	
		For 16 pounds lead pipe	1 60	
		For 1 ½-inch L. H. K. stops	1 00	
		For 2 ½-inch nipples	20	
		For 1¼ pounds fittings	2 19	
		For 1 ½ by ⅜ bushing	10	
		For 1 ⅜ socket	10	
		For 1 ½ nipple	10	
		For 1 ½ galvanized fitting, 12 long	50	
		For 1 ¾ galvanized fitting	50	
		For 1 ⅜ nipple	20	
		For repairing pump rod	1 25	
		For ½ pound pump leather	75	
		For 3 brass rods and 6 screws	4 00	
		For 16 feet ¼ B. pipe	1 60	
		For 1 pound galvanized fittings	1 25	
		For 1 ¾ Union	50	
		For 2½ feet 1-inch galvanized pipe	50	
		For 1 ⅜ nipple	20	
		For 3 feet 1 galvanized pipe	60	
		For 1 large galvanized sink and stand	15 00	
		For 24 days of plumber and assistant, in putting in and ventilating new closets and repairing old ones	168 00	
			———	$341 70
		W. D. Wyvill:		
Oct.	8.	For 1 4-inch T. C. bend	75	
		For 1 1 by ¾ steam ell	20	
		For 33 feet ¾ pipe	4 29	
		For 1 ¾ large screw	75	
		For 4 ½ steam ells	1 00	
		For 1 ¾ bushing	25	
		For 1 ½ large screw	50	
		For 23 feet ½ B. pipe	2 53	
		For 1 2 by 1½ bushing	25	
		For 1 1¼ reducer	25	
		For 5 feet 1½ black pipe	1 50	
		For 1 1¼ auger valve	3 25	
		For 10½ feet 1½ pipe	3 15	
		For 1-1½-inch ell	30	
		For 3 bolts	60	
		For 80 feet 1½ steam pipe	24 00	
		For 6 ½ ells	1 80	
		For 1 ½-inch reducing ell	15	
		For 1 ½ by ½ by ¼ T	15	
		For 1 ¾ Chapman's valve	3 00	
		For 1 1¼ ell	25	
		For 1 1½-inch large screw	1 60	
		For 1 1¼ union	50	
		For 1 1-inch large screw	1 00	
		For 1 1 by 1 by ⅜ T	25	
		For 2 ½ plugs	50	
		For 1 1½ ell	30	
		For 6 feet 1-inch B. pipe	1 20	
		For 2 feet ¼-inch B. pipe	20	
		For 4-¾ hooks	40	
		For 2 1½-inch steam ells	60	

1883.		W. D. Wyvill—Continued.		
Oct.	8.	For 1 cap and swivel	$0 75	
		For 4 feet 2½ B. pipe	2 00	
		For repairing steam gauge	50	
		For 1 hose reducer, at 80 cents; 1 cock, at 75 cents	1 55	
		For 12 gauge-glass washers	75	
		For 2 ½ bushing	40	
		For 8 1¼-inch nipples	3 20	
		For furnishing fire-clay and fire-brick and lining fire-pot of steam boiler	35 00	
		For taking down and rebuilding brick work around boiler, and 1 new smoke brick flue	120 00	
		For 1 new galvanized-iron smoke flue	45 00	
		For 20 days' time of steam-fitters and assistant in putting up steam pipe	140 00	
				$404 62
		Herdic Phaeton Co., S. G. Eberly, treasurer:		
	10.	For 633 street-car tickets, to be used by the messengers of the Department of Justice, while traveling on official business		25 00
		Wykoff, Seamans & Benedict:		
Sept.	1.	For repairs on type-writer, No. 2596	$12 50	
	20.	For repairs on type-writer, No. 2486 (4786)	67 50	
	28.	For 1 dozen ribbons	9 00	
		For 6 dozen rubber bands	1 50	
				90 50
		Acker & Co.:		
	27.	For casing up two fire-places in the Attorney-General's room with fire-brick, including material, at $12.50	25 00	
		For 2 square feet unglazed tile in fire-place in chief clerk's room	2 50	
				27 50
		James Curtis:		
Oct.	10.	For carrying one type-writer from Department of Justice to Remington type-writer office, in Le Droit Building		25
		George W. Knox:		
Sept.	10.	For freight and drayage on 4 crates furniture from Philadelphia		4 04
		D. J. Macarty:		
July	6.	For removing floor for plumber	$1 60	
	7.	For 4 days' labor, basement, frames, and doors	16 00	
		For 90 feet, 8 by 4 select lumber, at 7½ cents	6 75	
		For 2 pairs door hinges and screws	50	
		For 2 door locks, at $1.50	3 00	
		For 1 door bolt	75	
	9.	For replacing floor	1 20	
		For 6 keys to fifth floor and tags, at $1	6 00	
		For 4 keys to book case, at 50 cents	2 00	
		For 3 packing boxes, at $4	12 00	
	13.	For 10 days' labor remodeling cases on fifth floor	40 00	
		For 150 feet 4 by 4 lumber, remodeling cases on fifth floor, at 7 cents per foot	10 50	
		For nails and screws, remodeling cases on fifth floor	75	
	20.	For 1 day's labor, door of platform to tank	4 00	
		For 200 feet lumber, platform to tank, at 4 cents per foot	8 00	
		For nails, lock, and hinges	1 50	
	21.	For ¾ day's repairing floor	3 00	
		For 35 feet N. C. flooring, at 5 cents per foot	1 75	
	23.	For 2¼ days' labor on doors to case in library	10 00	
		For 40 feet lumber, doors to case in library, at 7½ cents per foot	3 00	
		For 8 pairs hinges, doors to case in library, at 10 cents	80	
		For 4 case locks, doors to case in library, at 50 cents	2 00	
		For 4 bolts, doors to case in library, at 10 cents	40	
		For screws and nails	20	
	26.	For 1 day's labor on basement window	4 00	
		For 64 feet lumber, basement window, at 4 cents per foot	2 56	
		For nails	18	
Aug.	2.	For ½ day's labor repairing floor on fifth story	2 00	
		For 8 feet base molding, at 2 cents per foot	16	
	4.	For ½-day's labor repairing case	2 00	
		For walnut and molding	46	

1883.		D. J. Macarty—Continued.		
Aug.	16.	For 1½ day's labor in walnut brackets	$6 00	
		For 10 feet walnut brackets, at 20 cents per foot	2 00	
		For sawing in mill, and screws	1 60	
	22.	For 400 file boards, at 5 cents	20 00	
	31.	For 3 days' labor on coal vault and basement	12 00	
		For 250 feet 4 by 4 lumber, vault and basement, at 3½ cents per foot	8 75	
		For 156 feet 3 by 4 lumber, vault and basement, at 3 cents per foot	4 68	
		For nails and screws	1 44	
		For 1 dozen bolts	1 20	
		For 10 feet 4 by 4 dressed lumber, at 5 cents per foot	50	
Sept.	7.	For 4 days' labor on closets on second floor	16 00	
		For 168 feet partition lumber, at 7 cents per foot	11 76	
		For 1 gross screws	70	
		For 4 pairs hinges	40	
		For 2 locks, at 75 cents	1 50	
		For 3 bolts, at 15 cents	45	
		For nails	30	
		For 1 dozen coat and hat hooks	50	
	12.	For 4 days' labor on closets on fifth floor	16 00	
		For 13 feet 4 by 4 lumber, at 5 cents per foot	65	
		For screws and nails	48	
	14.	For 2 days' labor on elevator and basement	8 00	
		For 20 feet dressed lumber, at 6 cents per foot	1 20	
	15.	For 1 lock to desk	75	
	18.	For 1½ days' labor, base in hallway	6 00	
		For 42 feet dressed lumber, at 7 cents per foot	2 94	
		For 32 feet molding, at 4 cents per foot	1 28	
		For nails	18	
	25.	For 1,296 feet 4 by 4 lumber, stable, at 3½ cents per foot	45 36	
		For 900 feet 1 by 2 lumber, stable, at 1 cent per foot	9 00	
		For 484 feet framing lumber, stable, at 2½ cents per foot	12 10	
		For lock, hinges, screws, nails, &c	7 00	
		For hauling dirt	3 60	
		For 8 days' labor, at $4	32 00	
Oct.	4.	For ½ day repairing floor	2 00	
		For 12 feet N. C. flooring	60	
			———	$385 98
		John W. Drew:		
	15.	For 1 gross Colgate's soap	18 00	
		For ¼ dozen Pear's glycerine soap	65	
		For ½ dozen hair-brushes	10 50	
		For ½ dozen hair-combs, at $9	4 50	
		For ½ dozen hair-combs, at $6	3 00	
		For 5 pounds sponge, at $2	10 00	
		For 5 pounds sponge, at $2.50	12 50	
		For 10 pounds insect-powder, Wilson's	10 00	
		For ½ dozen insect-powder, bellows	5 10	
			———	74 25
		William F. Lutz:		
July	21.	For 1 No. 3 self-inking stamp	8 00	
		For repairs and ink for 2 stamps	4 50	
			———	12 50
		Mutual District Messenger Company, William F. Chester, general manager:		
	31.	For rental night-watch box, July	5 00	
		For messenger service, as per ticket	30	
		For messenger service, as per ticket, furnished but lost by watchman	10	
			———	5 40
		Mutual District Messenger Company, William F. Chester, general manager:		
Aug	31.	For rental night-watch box, August		5 00
		Lorenzo Rice:		
	11.	For taking up 24 carpets, hauling to factory, cleaning and storing same, as per following itemized statement:		
		Second floor: room 5, 45 yards; room 6, 72 yards; room 7, 65 yards. Third floor: room 8, 50 yards; room 9, 82 yards; room 10, 105 yards; room 11, 65 yards; room 13, 46 yards;		

1883.		Lorenzo Rice—Continued.		
Aug.	11.	room 14, 80 yards; room 15, 72 yards. Fourth floor: room 16, 30 yards; room 17, 72 yards; room 21, 42 yards; room 22, 90 yards; room 23, 65 yards; other rooms, second, third, and fourth floors, 50, 40, 20, 70, 50, 50, 56, 18, 56 yards. Making, in all, 1,391 yards at 4 cents per yard		$55 64
Oct.	13.	Baltimore and Ohio Express (for Baltimore and Ohio Express Company, in settlement of the account of James W. Queen & Co., of Philadelphia, Pa., as follows):		
		For 1 barometer	$6 50	
		For returning the money	25	
		For freight charges	40	
				7 15
		De Krafft & Bruff:		
Oct.	6.	For supplying and putting on 1 transom-rod	1 75	
	6.	For repairing desk-drawers	50	
	12.	For repairing door	25	
		For raising carpet-strip and cutting off door	1 50	
		For raising box and putting on lid and hinges	1 25	
		For securing railing	25	
	15.	For repairing and upholstering chair and sofa	6 00	
	19.	For making 2 letter-writer stands	10 00	
	20.	For repairing and caning chair	1 50	
		For supplying and putting on 1 set of patent casters	1 50	
				24 50
		Baltimore and Ohio Express Company:		
Aug.	8.	For charges on package from New York	35	
	9.	For charges on package from New York	1 40	
	25.	For charges on package from New York	35	
				2 10
		S. J. Haislett:		
Oct.	20.	For taking down from windows of Department of Justice building 46 awnings		4 60
		Western Union Telegraph Company: For telegraphing during month of July, 1883, as per statement:		
July	2.	Brewster from Russell, Little Rock, 36	$1 08	
	3.	Brewster from Pritchard, Santa Fé, N. Mex., 47	2 35	
		Brewster from Allen, Fargo, Dak., 53	2 12	
	4.	Brewster from Pritchard, Santa Fé, 135	6 75	
	6.	Brewster to Smith, Denver, Colo., 22	1 00	
	7.	Brewster to Melton, Charleston, S. C., 78	1 56	
		Brewster from Smith, Denver, Colo., 36	1 44	
		Brewster from Waddell, Alexandria, Va., 82	82	
	9.	Brewster to Smith, Birmingham, Ala., 171	3 42	
		Brewster to Bliss, New York, 62	40	
		Brewster to Smith, Denver, Colo., 17	1 00	
		Brewster to Allen, Fargo, Dak., 17	1 00	
		Brewster to Waddell, Alexandria, Va., 42	42	
	10.	Brewster from Shannon, Miles, Mont., 35	1 40	
		Blair to Eubank, Warm Springs, Va., 18	25	
		Blair to Simons, Indianapolis, Ind., 36	72	
		Blair from Elliott, Warm Springs, Va., 14	25	
		Young to Robinson, Warm Springs, Va., 28	28	
		Young from Robinson, Warm Springs, Va., 10	10	
	11.	Phillips to Morphis, Oxford, Miss, 18	50	
		Brewster to Sheldon, Tucson, Ariz., 20	1 50	
		Brewster from Morphis, Oxford, Miss., 33	66	
		Brewster from Russell, Little Rock, Ark., 40	1 20	
		Brewster from Stone, Grand Rapids, Mich., 48	96	
	12.	Phillips to Russell, Little Rock, Ark., 17	75	
		Phillips to Stone, Grand Rapids, Mich., 26	52	
	13.	Phillips to Morphis, Oxford, Miss., 26	52	
		Brewster from Morphis, Oxford, Miss., 24	50	
		Blair to Robinson, Warm Springs, Va., 5	40	
		Blair from Robinson, Warm Springs, Va., 10	40	
		Stanton to Brewster, Long Branch, N. J., 39	39	
		Stanton from Brewster, Long Branch, N. J., 133	1 33	
		Cameron from Brewster, Long Branch, N.J., 277	2 77	
		Cameron from Brewster, Long Branch, N. J., 120	1 20	

1883.	Western Union Telegraph Company—Continued.	
July 13.	Cameron from Brewster, Long Branch, N. J., 98	$0 98
	Cameron from Brewster, Long Branch, N. J., 84	84
	Cameron to Brewster, Long Branch, N. J., 85	85
13.	Cameron to Brewster, Long Branch, N. J., 300	3 00
	Cameron to Brewster, Long Branch, N. J., 115	1 15
	Cameron to Brewster, Long Branch, N. J., 42	42
	Ewing to Young, Philadelphia, 23	20
14.	Ewing from Young, Philadelphia, 5	15
	Ewing to Townsend, Troy, 20	15
	Ewing to Brewster, Long Branch, 40	40
	Young from Brewster, Long Branch, 228	2 28
	Brodie from Lee, Philadelphia, 27	20
16.	Young to Brewster, Long Branch, 23	25
	Young to Brewster, Long Branch, 32	32
17.	Young to Brewster, Long Branch, 53	53
	Young from Brewster, Long Branch, 39	39
	Ewing to McMahon, Brooklyn, N. Y., 18	15
18.	Young to Brewster, Long Branch, 40	40
	Young to Sniz, Richmond, 33	33
	Phillips to Root, New York City, 17	15
	Blair to Howe, Chicago, 23	50
19.	Blair to Simons, Indianapolis, 70	1 40
	Blair to Bates House, Indianapolis, 12	50
	Blair from Bates House, Indianapolis, 4	50
	Blair from Howe, Chicago, 6	50
	Young to Brewster, Long Branch, 67	67
21.	Phillips to Skaats, Mobile, 51	1 53
	Phillips to Reeves, Knoxville, 27	54
	Phillips to McClain, Nashville, 34	68
	Young to Cameron, Harrisburg, 52	35
	Young to Brewster, Long Branch, 51	51
	Brewster from Zabriskie, Tucson, 43	2 58
	Phillips from McClain, Nashville, 28	56
	Young from Cameron, Harrisburg, 24	20
	Phillips from Skaats, Mobile, 45	1 35
23.	Perry to Woods, Newark, Ohio, 22	25
	Young to Brewster, Long Branch, 49	49
	Young to Brewster, Long Branch, 67	67
	Blair to Brewster, Long Branch, 29	29
24.	Blair to Brewster, Long Branch, 78	78
	Young to Brewster, Long Branch, 38	38
	Young to Brewster, Long Branch, 120	1 20
	Young from Brewster, Long Branch, 25	25
	Young from Brewster, Long Branch, 59	59
	Young from Brewster, Long Branch, 89	89
	Young from Bliss, New York, 14	15
	Young to Evans, San Antonio, 69	2 76
	Phillips to Pinney, Joliet, Ill., 20	50
	Young to Cameron, Utica, 26	20
	Young to White, Boise City, Idaho, 49	5 90
	Young to Van Zile, Salt Lake, Utah, 49	2 45
	Young from Van Zile, Salt Lake, Utah, 68	3 40
	Young from Brewster, Long Branch, 29	29
	Young to Brewster, Long Branch, 78	78
	Young to Brewster, Long Branch, 64	64
26.	Young to Brewster, Long Branch, 75	75
	Young to Brewster, Long Branch, 37	37
	Young from Brewster, Long Branch, 135	1 35
	Young from Cameron, Utica, 37	25
	Perry to Cameron, Utica, 46	30
	Phil ips to Davis, Bloomington, 24	50
	Phillips to Green, Olympia, Washington Ter., 36	2 60
	Phillips to Pinney, Joliet, Ill., 30	60
	Brewster from Van Zile, Ogden, Utah, 84	3 20
27.	Brewster from White, Boise City, Idaho, 96	11 80
	Young from Brewster, Long Branch, 91	91
	Young to Brewster, Long Branch, 60	60
	Young to Brewster, Long Branch, 81	81
	Young to Brewster, Long Branch, 141	1 41
	Young to Shannon, Helena, Mont., 45	2 70

1883.		Western Union Telegraph Company—Continued.		
July	27.	Young from Blair, Montgomery, 17	$0 50	
		Young from White, Boise City, Idaho, 73	8 39	
		Young from Brewster, Long Branch, to Pruden, 115	1 15	
		Stanton to Brewster, Long Branch, 34	34	
		Perry from Cameron, Albany, 35	25	
		Perry from Cameron, Albany, 26	20	
	28.	Young to Brewster, Long Branch, 55	55	
		Young to Brewster, Long Branch, 32	32	
		Stanton from Brewster, Long Branch, 122	1 22	
		Young from Brewster, Long Branch, 105	1 05	
	31.	Young to Brewster, Long Branch, 52	52	
		Young to Brewster, Long Branch, 38	38	
		Young to Brewster, Long Branch, 60	60	
		Young from Blair, Montgomery, 16	50	
		Young from Brewster, Long Branch, 74	74	
		Young from Brewster, Long Branch, 98	98	
		Young from Brewster, Long Branch, 85	85	
		Brewster from Schuyler, Deer Lodge, Mont., 37	2 22	
		Perry to Cameron, Burlington, Vt., 26	52	
		Perry from Cameron, Burlington, Vt., 24	50	
			———	$138 41
		For telegraphing during month of July, 1883, as per following statement:		
July	2.	Rayner to Williams, Key West, 27	81	
	6.	Rayner to De Witt, Butte, Mont., 23	1 50	
		Rayner to Root, New York, 61	40	
		Rayner from Clark, New York, 15	15	
	9.	Rayner from Botkin, Helena, Mont., 25	1 50	
		Rayner to Townsend, Troy, 13	15	
	10.	Rayner from Townsend, Troy, 25	20	
	12.	Rayner to Searle, Saint Paul, 27	81	
		Rayner to Root, New York, 18	15	
		Rayner to Trimble, Mobile, 22	60	
	13.	Rayner from Trimble, Mobile, 19	60	
	14.	Rayner to Converse, Springfield, Ill., 77	1 54	
	17.	Rayner to Richards, Cincinnati, Ohio, 33	64	
		Rayner from Hoope, Cincinnati, Ohio, 26	43	
	23.	Rayner to Corkhill, Washington, D. C., 36	25	
	26.	Rayner to Michaels, Chicago, 103	4 12	
		Rayner to Jewett, Chicago, 82	3 28	
	31.	Rayner to Michaels, Chicago, 61	1 22	
			——	18 35
		For telegraphing during month of August, 1883, as per following statement:		
Aug.	1.	Young to Blair, Montgomery, Ala., 62	1 24	
		Phillips to Botkin, Helena, Mont., 36	2 16	
		Young to Boles, Fort Smith, Ark., 24	75	
		Phillips to Decker, Denver, 27	1 08	
		Attorney-General from Botkin, Helena, Mont., 17	1 50	
		Young from Brewster, Long Branch, 55	55	
	2.	Young to Blair, Montgomery, 62	1 24	
		Young to Brewster, Long Branch, 42	42	
	3.	Young to Hayward, Richmond, Ind., 28	56	
		Young to Sloss, Huntsville, Ala., 32	64	
		Young from Blair, Pass Christian, Miss., 75	2 25	
		Young from Brewster, Long Branch, 172	1 72	
		Young to Brewster, Long Branch, 80	80	
	4.	Young to Brewster, Long Branch, 73	73	
		Young from Brewster, Long Branch, 63	63	
		Young from Blair, Pass Christian, 90	2 70	
		Young to Blair, Pass Christian, 163	4 89	
		Young to chief operator, Port Huron, 41	82	
		Young from manager, Port Huron, 21	50	
	6.	Young to Rives, Knoxville, Tenn., 20	50	
		Young from Blair, Montgomery, 110	2 20	
		Phillips to Livingston, Greenville, S. C., 22	50	
		Phillips to Allen, Fargo, Dak., 35	1 40	
	7.	Phillips to Waters, Little Rock, 23	75	
		Young to Blair, Montgomery, Ala., 167	2 14	
		Young from Blair, Montgomery, Ala., 20	50	

1883.		Western Union Telegraph Company—Continued.		
Aug.	7.	Young from Brewster, Long Branch, 95	$0 95	
		Young to Brewster, Long Branch, 117	1 17	
		Brewster from Fay, Denver, 40	1 60	
	8.	Brewster to Conger, Port Huron, Mich., 202	4 04	
		Brewster to manager, Port Huron, Mich., 34	68	
		Young to Brewster, Long Branch, 45	45	
		Young to Brewster, Long Branch, 28	28	
		Phillips to Waddell, Richmond, 34	34	
	9.	Young to Clark, New York, 34	25	
		Young to Ingalls, Atchison, 38	1 12	
		Young to Brewster, Long Branch, 22	25	
		Young to Brewster, Long Branch, 52	52	
		Young from Brewster, Long Branch, 159	1 59	
		Phillips from Waddell, Richmond, 32	32	
July	9.	Cameron from Brewster, Long Branch, 127	1 27	
		Cameron to Brewster, Long Branch, 54	54	
	10.	Phillips to Root, New York, 27	20	
		Young from Brewster, West End, Long Branch, 57	57	
		Young from Brewster, West End, Long Branch, 50	50	
		Brewster from Foster, Indianapolis, Ind., 36	72	
	11.	Young to Brewster, Long Branch, 39	39	
		Phillips to Pitken, New Orleans, La., 30	80	
	13.	Phillips to Waddell, Richmond, Va., 23	25	
		Phillips to Root, New York, 13	15	
	14.	Young from Brewster, West End, Long Branch, 82	82	
	20.	Brewster to Archer, Philadelphia, 73	45	
	21.	Brightly to Archer, Philadelphia, 34	25	
	22.	Phillips to Hoyt, Olympia, Wash., 28	1 80	
		Phillips to Pallette, Denver, 40	1 60	
	23.	Attorney-General from Haslett, Denver, 29	1 16	
		Phillips to Blair, Huntingdon, Pa., 26	26	
		Phillips from Blair, Huntingdon, Pa., 41	41	
	24.	Phillips to Ramsay, Salt Lake, 21	1 25	
		Cameron to Attorney-General, Long Branch, 29	29	
	25.	Brewster to Crosby, Fort Ellis, Mont., 117	7 02	
		Cameron to Attorney-General, Long Branch, 169	1 69	
		Cameron from Brewster, Long Branch, 48	48	
	27.	Brewster to Bentley, Denver, Colo., 85	3 40	
	28.	Brewster from Bentley, Denver, Colo., 33	1 32	
	29.	Cameron to Brewster, Newport, 77	77	
		Cameron from Brewster, Newport, 64	64	
			———	$75 73
	22.	Robinson to Searle, Saint Paul, 36	1 08	
		Robinson from Searle, Saint Paul, 16	75	
	23.	Robinson to Irwin, Tionesta, Pa., 27	27	
			———	2 10
		For telegraphing during month of September, 1883, as follows:		
Sept.	1.	Phillips to Hunter, Salt Lake City, 29	1 45	
		Cameron from Brewster, Newport, 57	57	
	3.	Brewster from Bentley, Denver, 32	1 28	
		Brewster from Decker, Denver, 68	2 72	
	4.	Phillips to Krekel, Jefferson City, 19	75	
	6.	Cameron from Brewster, Newport, 56	56	
	7.	Maury to Bentley, Denver, 46	1 84	
		Maury to Dezouche, Philadelphia, 11	15	
		Attorney-General from Bentley, Denver, 30	1 20	
		Phillips from Crosby, Helena, 83	4 98	
	12.	Maury to Hilboru, San Francisco, 31	2 10	
		Cameron to Brewster, Newport, 108	1 08	
		Cameron from Brewster, Newport, 91	91	
		Cameron to Attorney-General, Newport, 37	37	
		Young from Brewster, Newport, 50	50	
	13.	Brewster to Conger, Saint Paul, 205	6 15	
	15.	Maury to Campbell, Yankton, 37	1 11	
		Brewster from Bentley, Denver, 46	1 84	
		Brewster from Conger, Saint Paul, 50	1 50	
		Nourse from Campbell, Sioux Falls, 30	90	
	18.	Brewster from Hilborn, San Francisco, 47	3 29	
		Cameron to Attorney-General, Newport, 85	85	

1883.	Western Union Telegraph Company—Continued.			
Sept. 19.	Cameron to Brewster, Newport, 63		$0 63	
	Maury to Pitkin, New Orleans, 27		68	
	Maury to Keogh, Greensborough, 25		25	
	Young to Keogh, Greensborough, 20		25	
	Young from Brewster, Newport, 137		1 37	
20.	Maury to Hilborn, San Francisco, 38		2 66	
21.	Young from Schuyler, Helena, 70		4 20	
22.	Simons to Blair, Salt Lake City, 39		1 95	
	Young to Brewster, Newport, 65		65	
	Maury to Leonard, New Orleans, 36		1 08	
24.	Maury to Tidball, Tucson, 65		3 90	
	Maury to McGee, Kansas City, 21		60	
	Maury from McGee, Kansas City, 24		60	
25.	Fay to Blair, Salt Lake City, 31		1 55	
	Brewster from Gurley, New Orleans, 39		1 16	
	Attorney-General from Bentley, Trinidad, 50		2 00	
	Young to Brewster, Newport, 49		49	
	Young from Brewster, Newport, 71		71	
26.	Phillips to Reeves, Bloomington, Ill., 26		52	
27.	Phillips to Nightingale, Helena, 37		2 22	
28.	Simons from Blair, Salt Lake City, 33		1 65	
	Attorney-General from Bentley, Trinidad, 33		1 32	
	Phillips from Nightingale, Benton, Mont., 31		1 86	
29.	Phillips to Bentley, Trinidad, 39		1 56	
	Phillips to Crosby, Helena, 25		1 50	
				$71 46
	For telegraphing during month of September, 1883, as per statement:			
Sept. 28.	Rayner to Reeves, Bloomington, Ill., 32		64	
	Rayner to Evans, Austin, 39		1 56	
	Rayner from Evans, Austin, 21		1 00	
				3 20
1883.	Great Falls Ice Company:			
July 31.	For 5,950 pounds ice, at 40 cents per 100 pounds		$23 80	
Aug. 31.	For 6,000 pounds ice, at 40 cents per 100 pounds		24 00	
Sept. 30.	For 5,750 pounds ice, at 40 cents per 100 pounds		23 00	
				70 80
	Henry Coleman:			
Oct. 31.	For washing 19 dozen and four (4) towels during the month of October, 1883, at 30 cents per dozen			5 80
	Peter Carroll:			
Oct. 31.	For ten days' labor at Department of Justice building during the month of October, 1883		$10 00	
	For putting in position four iron tree-boxes, furnishing rich earth, sod, &c., and placing same around trees in front of Department of Justice building		3 00	
				13 00
	James Hughes:			
Oct. 8.	For furnishing all materials and plastering under stairs on floor A, Department of Justice building, also for repairing plaster work in the rooms of Solicitor-General and Assistant Attorney-General, floor B			10 00
	Paul Boileau:			
Oct. 31.	For washing 5 dozen towels, at 3 cents each			1 80
	Ellen Lucas:			
Oct. 31.	For washing for the use of the office of the Solicitor of the Treasury, during the month of October, 1883, ten dozen towels, at 30 cents per dozen			3 00
	Charles Frost:			
Nov. 1.	For hauling 1 load of books (in large bags) from Department of Justice to Supreme Court United States			1 00
	W. D. Wyvill:			
July 7.	For 25 pounds cotton-waste, at 15 cents		$3 75	
14.	For 6 lamp chimneys, at 15 cents		90	
Aug. 13.	For 5 gallons sperm oil, at $1.75		8 75	
22.	For 10 gallons vasoline, at $1.75		17 50	
24.	For 1 funnel		50	
Sept. 4.	For 6 boxes gold-gloss polish		1 50	
1.	For 1 ice-pick		25	

1883. W. D. Wyvill—Continued.

Sept.	1.	For 3 block scrubs	$1 50
		For 3 handles	30
		For 6 mops	1 50
		For 1 mop-handle	25
	12.	For 1 rubber pressure cup	1 00
		For 1 patent brace and bit	3 50
		For 10 pounds plumbago packing	5 00
		For 3 locks	1 50
		For 2 catches	50
	17.	For ½ dozen corn brooms	2 50
		For 1 hair sweep	2 50
	20.	For 5 pounds green paint	1 25
		For 1 paint bucket	50
		For 2 paint brushes	60
		For 4 pounds red and black putty	80
	22.	For 1 window brush	75
		For 1 sponge	50
	24.	For 1 ax handle	25
	26.	For 25 pounds cotton waste	3 75
		For 10 pounds 3-16 asbestos steam packing	4 00
	28.	For 2 whitewash brushes	4 50
		For 313 feet of tin roofing	21 91
	30.	For 5 pints turpentine	50
Oct.	6.	For ½ gallon green paint	1 50
		For 4 iron tree boxes	22 00
		For 2½ joints 5-inch pipe	88
		For 2 elbows	70
		For 1 damper	25
		For 2 5½ oval elbows	1 00
		For putting up 2 stoves and polishing 3 stoves and pipes	5 00
	9.	For 7 pounds umber	1 75
		For 1 pound lampblack	15
		For 3 pints turpentine	30
		For 2 camel hair brushes	1 50
		For 1 tray	50
		For 1 oil can	25
		For polishing stove	1 00
	10.	For 2 pounds candles	30
		For 1 candlestick	25
	17.	For 1 chimney	15
		For 1 shade for argand lamp	75
	19.	For 1 brass fender	10 00
		For 1 pair brass andirons	8 00
	23.	For 1 zinc stove board	1 50
		For 6 boxes tapers	1 50
		For 3 pounds packing	1 50
		For 2 brass wood carriers	18 00
	24.	For polishing and putting up stove and pipe	2 00
	29.	For 2 brass standards	8 50
		For 2 brass fire sets	14 00
		For 25 feet of ¾-hose	6 25
		For 1 branch pipe	1 00
	30.	For 1 brass fire screen	11 00
		For 2 1½ steam ells	60
		For 1 ½-inch large screw	50
		For 3¼ pounds sheet gum	2 44
		For 3 pounds red lead	60
		For 44 feet black pipe	8 80
		For 10 nipples	2 00
		For 2 sockets	30
		For 8 fittings	1 60
		For 1 ¼-inch reducer	20
		For 1 steel chisel	75
		For 2 ¾-unions	1 00
		For repairing letter press	4 00
	31.	For 2¼ days' time workman repairing steam radiators	11 25
		For 1 stamped cup	10
		For 2 soldering irons and handles	1 50
		For 2 bars solder	80
		For gold varnish liquid	75

1883.		W. D. Wyvill—Continued.		
Oct,	31.	For 1 pair hose couplings	$0 50	
		For 1 pair clamps	20	
		For 1 end	20	
		For 5 nickel-plated door plates, at $1.50	7 50	
				$259 58
		Baltimore & Ohio Express Company:		
Oct.	24.	For freight charges on 1 package Government property from Wheeling, W. Va., to A. J. Bentley, law clerk and examiner of titles, Department of Justice		35
		John Wells:		
Nov.	2.	For hauling 12 loads ashes from engine-room, Department of Justice, at 30 cents		3 60
		De Krafft & Bruff:		
Oct.	23.	For repairing 1 chair	$0 60	
		For fitting 2 keys	50	
	24.	For supplying and putting on 2 transom rods	3 50	
		For 40 feet of weather strips	4 00	
		For 4 sash cords	2 25	
Nov.	1.	For supplying and putting on 1 lock and repairing drawer	1 50	
		For supplying and putting on 1 Yale desk-lock and repairing door and drawer	3 50	
				15 85
		Adams Express Company (for freight charges for transportation of Government property, as follows):		
Aug.	2.	For 1 package to Hon. B. H. Brewster, Long Branch, N. J	50	
	6.	For 1 package from Philadelphia, Pa., for J. R. Young.	40	
	7.	For 1 package from Saint Paul, Minn., for B. H. Brewster.	2 80	
	8.	For 1 package to Hon. W. A. Maury, White Sulphur Springs, W. Va	50	
	15.	For 1 package from Philadelphia, Pa., for J. R. Young.	50	
	23.	For 1 package from White Sulphur Springs for J. R. Young	50	
				5 20
Oct.	2.	For 2 bundles from Philadelphia, Department of Justice.	60	
	6.	For 1 bale from Philadelphia, Department of Justice ...	1 25	
	8.	For 1 bale to J. F. Orme, Philadelphia	1 25	
	15.	For 1 bale from Philadelphia, Department of Justice...	30	
		For 1 package to J. J. DeZouche & Co., Philadelphia...	25	
	24.	For 1 package from New York, A. Hopkins, for Mr. Simons	50	
		For 1 package $500 to R. Ballin, New Orleans, La	2 25	
	26.	For 1 package from Philadelphia, Department of Justice.	25	
				6 65
Sept.	4.	For 1 package, value $50, from Saint Louis, for B. Cameron	45	
	6.	For 1 package from Philadelphia, Pa., for Department of Justice	25	
	24.	For 1 package from Charlottesville, Va., for W. A. Maury.	30	
	26.	For 1 package from Boston, for J. M. Ewing	45	
	27.	For 2 boxes from New York, for Department of Justice..	6 15	
				7 60
		L. C. Bishop:		
Sept.	20.	For 1 box sand soap	3 60	
Oct.	24.	For 50 reams W. C. paper	9 00	
		For 1 gross matches	3 00	
				15 60
1883.		W. B. Moses & Sons:		
July	10.	For 5 pieces matting, binding, laid	5 00	
		For 100 yards old fancy matting, laid on third floor, at 5 cents	5 00	
	28.	For 3 brass poles, to order	75 00	
		For 3 pair Madras curtains, special trimmings, at $30.50.	91 50	
	30.	For 3 pair extra large curtain holders, at $15	45 00	
		For putting 18 yards tarlatan on 1 chandelier and 3 poles	1 50	
Aug.	1.	For 1 walnut book-case	26 00	
		For 80 yards best seamless white mattinag, sewed and laid, at 70 cents	56 00	

1883.		W. B. Moses & Sons—Continued.		
Aug.	1.	For 2 pieces binding, laid	$2 00	
	3.	For 4 shades, $2 each, $8; 3 transoms, 50 cents each, $1.50	9 50	
	6.	For hanging 3 leather lambrequins and striping walls	5 00	
		For 16 yards tap. border, sewed and laid, at 95 cents	15 20	
		For cutting, fitting, sewing, and laying 78 yards old carpet, at 10 cents	7 80	
		For 15¾ yards tap-border, at 85 cents	13 39	
		For tacking on same, at 5 cents	79	
		For laying 30 yards old matting, at 5 cents	1 50	
Sept.	24.	For taking up 164 yards matting, at 6 cents	9 84	
		For 1 bottle ebony polish	1 00	
		For laying 148 yards old carpet, at 5 cents	7 40	
	26.	For 86½ yards body Brussels, sewed and laid, at $1.60	138 40	
		For 65 yards lining, at 10 cents	6 50	
		For laying 170 yards old carpet, at 5 cents	8 50	
		For 97¾ yards body Brussels, sewed and laid, at $1.60	156 40	
		For 70 yards lining, at 10 cents	7 00	
Oct.	2.	For laying 853 yards old carpet, at 5 cents	42 65	
	5.	For laying 90 yards old carpet, at 5 cents	4 50	
	16.	For laying 9½ yards 4-4 cocoa matting, at 75 cents	7 13	
		For 2 pair brass ends	1 00	
Nov.	9.	For 1 mirror	2 50	
	27.	For ebonizing Congressional chair	2 50	
		For ebonizing letter type writer	3 50	
		For hauling and storage on 2 large rugs, and cleaning same	15 00	
		For taking down tarlatan from chandelier	1 00	
		For taking down, packing, and storage on 4 pairs heavy draperies and rehanging same	25 00	
				$800 00
		J. C. Blair:		
July	9.	For 250 improved tablets for the use of the stenographers in Department of Justice		17 50
		Herdic Phaeton Company:		
Nov.	15.	For 633 street-car tickets for use of messengers while traveling on official business		25 00
		G. A. Matthews:		
Nov.	14.	For hauling envelopes, letter paper, books, and miscellaneous, Government Printing Office		1 50
		J. R. F. Carpenter:		
Nov.	15.	For furnishing all materials, and plastering the lower portion of the elevator		15 00
		Julius Baumgarten:		
		For one fac-simile wood cut	$2 75	
		For one rubber die	1 25	
		For one patent self-inker	8 50	
		For one rubber stamp	1 50	
				14 00
		H. L. Cranford:		
		For the labor of laying the granolithic pavement in front of the Department of Justice building; all materials being furnished by the Commissioners of the District of Columbia (157.80 square yards)		142 02
		Henry Coleman:		
	30.	For washing 17½ dozen towels for Department of Justice, for month of November, 1883, at 30 cents per dozen		5 37
		Ellen Lucas:		
		For washing for the use of the office of the Solicitor of the Treasury during the month of November, 1883, 8 dozen towels, at 30c. per dozen		2 40
Dec.	1.	Herdic Phaeton Company, Samuel G. Eberly, treasurer: For 633 street-car tickets for use of messengers while traveling on official business for Department of Justice		25 00
Nov.	9.	W. D. Wyvill: For 6 cotton mops, at 25 cents, $1.50; 1 dust-brush, 75 cents	$2 25	
		For 1 dust-pan	25	
	16.	For 10 gallons vasaline oil, at $1.75	17 50	
	17.	For 1 No. 16 revolving light stove	50 00	

1883.		W. D. Wyvill—Continued.		
Nov.	17.	For 15 joints 6-inch pipe, at 50 cents, $7.50; 2 elbows, at 50 cents, $1	$8 50	
		For 1 zinc board, $1.50; 1 flange, 25 cents	1 75	
		For cutting hole and putting up stove	2 00	
	19.	For 2 No. 14 revolving light stoves, $40	80 00	
		For 4 joints pipe, at 50 cents, $2; 4 elbows, at 50 cents, $2	4 00	
		For 2 zinc boards, at $1.50, $3; 1 sheet-iron grate board, $1.25	4 25	
		For 7 pounds fire-board, at 25 cents, $1.75; 18 pieces mica to stove, $1.50	3 25	
		For putting up stoves	1 50	
	20.	For 1 20-inch feather duster	2 25	
	21.	For 3 dust-brushes, at 75 cents, $2.25; 3 long-handled shovels, at 25 cents, 75 cents	3 00	
		For 12½ pounds white lead, at 10 cents, $1.25; 1 gallon turpentine, 80 cents	2 05	
		For 1 oil-can, 40 cents; ½ dozen boxes gold gloss polish, $1.50	1 90	
		For cleaning out 2 flues	3 00	
	23.	For 2 14-inch feather dusters, $1.75; 1 16-inch feather duster, $2; 2 20-inch feather dusters, at $2.25, $4.50	10 00	
	27.	For lining grate with soapstone	10 00	
		For 1 grate with extra large basket, and setting same	45 00	
			———	$252 45
		John Wells:		
Dec.	3.	For hauling ashes (17 loads) from engine room of Department of Justice building during the month of November, 1883, at 30 cents per load		5 10
		William Watson:		
		For hauling 12 boxes from Department of Justice to Government Printing Office		50
		Charles A. Bruff:		
Nov.	24.	For supplying and putting one morticed tumbler lock with brass face and bolts	$4 50	
	28.	For rehanging one door	1 50	
		For hanging and fitting door and supplying lumber	2 25	
		For supplying and putting on window lifts	50	
Dec.	1.	For supplying and putting in 2 sash cords	1 00	
		For supplying and putting on 105 feet of weather strips	13 63	
			———	23 38
		James G. Berrett:		
Nov.	20.	For 96 sets of the Clayton window wedges		24 00
		W. H. Marlow:		
Sept.	17.	For $58\frac{1150}{2240}$ tons W. A. furnace coal, at $5.60	327 67	
		For 10 tons W. A. stove coal, at $5.95	59 50	
Nov.	9.	For 30 cords hickory wood, at $7	210 00	
		For stowing away 30 cords wood, at 60 cents	18 00	
		For stowing away $68\frac{1150}{2240}$ tons coal	4 50	
			———	619 67
		Baltimore and Ohio Express:		
Nov.	2.	For package from New York	65	
	6.	For package from New York	70	
			———	1 35
		R. C. McChesney:		
Dec.	6.	For hauling one load of books from Department of Justice to the Capitol building	1 25	
		For one load of books from Department of Justice to city post-office	1 00	
			———	2 25
		J. R. McChesney:		
	13.	For hauling two (large) loads of books from Department of Justice to city post-office and Government Printing Office		1 25
		Frank B. Conger:		
Sept.	30.	For box-rent and postage on official letters from July 1 to September 30, 1883		3 17
		D. Rickenbacher:		
May	18.	For putting up a hall clock	$2 00	
July	2.	For repairing a lever clock	1 00	
Oct.	3.	For repairing and cleaning calendar clock	3 50	

1883.		D. Rickenbacher—Continued.		
Oct.	15.	For a new nickel clock	$1 50	
	27.	For repairing a lever clock	2 00	
Nov.	23.	For a new nickel clock	1 50	
		For repairing a nickel clock	1 00	
Dec.	20.	For repairing a nickel clock	1 00	
		For winding clocks in the building for eight months	40 00	
				$53 50
		Wyckoff, Seamans & Benedict:		
	17.	For repairs on No. 2576 machine (Miss Mahon)	16 50	
		For one roller for No. 3485 machine (Mrs. Fry)	2 50	
		For repairs on No. 3116 machine (Mr. Wilson)	6 60	
				25 60
		Henry Coleman:		
	31.	For washing towels for Department of Justice for month of December, 1883, 17¾ doz., at 30c		5 32
1884.		Herdic Phaeton Company:		
Jan.	3.	For 633 street car tickets for use of messengers when traveling on official business for the Department of Justice, at 3.95 cents.		25 00
1883.		Ellen Lucas:		
Dec.	31.	For washing for use of the office of the Solicitor of the Treasury during the month of December, 1883, 7⅓ doz. towels, at 30 cents.		2 20
1884.		John Wells:		
Jan.	5.	For hauling 16 loads ashes from Department of Justice building, at 30 cents per load		4 80
		Alfred Brown:		
	8.	For one day's labor shoveling snow from the sidewalk in front of Department of Justice building and parking adjoining building		1 00
1883.		George Carroll:		
Dec.	24.	For one day's labor cleaning off snow from pavement in front of Department of Justice building and parking adjoining		1 00
		L. C. Bishop:		
Dec.	20.	For 50 reams w. c. paper	$9 00	
		For 1 gross parlor matches	3 00	
				12 00
1884.		John K. McChesney:		
Jan.	9.	For hauling one load books to city post-office	1 00	
	10.	For hauling one load books to city post-office	1 00	
	11.	For hauling one load books to city post-office	1 00	
				3 00
1883.		Harris & Shafer:		
Aug.	1.	For one ice-pitcher		12 00
		D. J. Macarty:		
Oct.	13.	For 1 day's labor repairing floor, &c	4 00	
		For 7 feet 5 by 4 flooring lumber, at 5 cents per foot	35	
		For nails	25	
	19.	For 1 window of sash in stable	2 50	
		For ½ day's labor	2 00	
		For lumber and nails	30	
	25.	For 1 day's labor in basement	4 00	
		For 34 feet 8 by 4 dressed lumber, at 8 cents per foot	2 72	
		For 2 iron brackets	40	
		For nails and screws	25	
Nov.	15.	For hauling 6 loads of dirt, at 60 cents per load	3 60	
		For labor and material in constructing three wood and coal boxes and 2 carrying boxes, 365 feet 4 by 4 dressed lumber, at 6 cents per foot	21 90	
		For 18 feet 8 by 4 dressed lumber, at 7 cents per foot	1 26	
		For 5 pairs hinges and screws	1 25	
		For 1 gross 1¾-inch screws	60	
		For 20 pounds nails, at 5 cents per pound	1 00	
		For 6½ day's labor, at $4 per day	26 00	
	20.	For ½ day's labor repairing front door	2 00	
		For 8 feet molding, at 4 cents per foot	32	
Dec.	13.	For labor and material in constructing partition in basement at elevator, to wit:		
		For 37 feet 6 by 4 dressed lumber, at 7 cents per foot	2 59	

1883.		D. J. Macarty—Continued.		
Dec.	13.	For 11 feet 4 by 4 partition, at 7 cents per foot	$0 77	
		For 1 door lock	1 50	
		For hinges, screws, and nails	95	
		For 3 day's labor, at $4 per day	12 00	
				$92 51
		Western Union Telegraph Company: For telegraphing during the month of October, 1883, as per following statement, viz:		
Oct.	1.	Young to Brewster, Philadelphia, 34	25	
		Simons to Howe, Chicago, 37	25	
		Phillips to Boyd, Greensborough, N. C., 35	35	
	2.	Fay to Lyon, Shreveport, La., 47	1 41	
		Attorney-General from Bentley, Denver, Colo., 34	1 36	
	4.	Phillips to Auxier, Louisville, 18	50	
	5.	Howe to Pinnell, Kansas, Ill., 66	1 32	
		Cameron from Brewster, Philadelphia, 111	65	
	6.	Phillips to Smith, Denver, 22	1 00	
		Attorney-General from Bentley, Denver, 35	1 40	
		Brewster from Smith, Denver, 29	1 16	
		Cameron to Attorney-General, Philadelphia, 53	35	
		Phillips to De Witt, Helena, Mont., 29	1 74	
	8.	Howe to Pinnell, Kansas, Ill., 22	50	
		Young to Brewster, Philadelphia, 74	45	
		Young from Brewster, Philadelphia, 94	55	
		Ker to Woodward, Hartford, Conn., 19	15	
	9.	Howe to Fay, Saint Charles, Mo., 24	50	
		Phillips to Botkin, Helena, Mont., 26	1 56	
		Phillips to Miller, San Francisco, 41	2 87	
		Howe from Pinnell, Kansas, Ill., 32	64	
		Howe to Suter, Saint Louis, Mo,, 38	76	
		Howe from Clague, Saint Louis, Mo., 37	74	
	10.	Maury to Campbell, Yankton, Dak., 40	1 20	
		Cameron from Brewster, Philadelphia, 23	20	
		Young from Brewster, Philadelphia, 17	15	
		Phillips from Botkin, Helena, Mont., 21	1 50	
	11.	Howe to Pinnell, Kansas, Ill., 26	52	
	12.	Brewster to Sheppard, New York, 72	45	
		Brewster to Griffith, New York, 26	20	
		Brewster to Van Zile, Salt Lake, 55	2 75	
	13.	Brewster to Van Zile, Salt Lake, 56	2 80	
		Brewster from Nightingale, Deer Lodge, Mont., 49	2 94	
	15.	Brewster to Coleridge, Philadelphia, 191	1 91	
		Brewster to Stone, Pittsburgh, 75	45	
		Brewster to Zeublin, Philadelphia, 44	30	
		Brewster to Dezouche, Philadelphia, 111	65	
		Brewster from Stone, Pittsburgh, 64	40	
	16.	Brewster to Patterson, Harrisburg, 157	85	
		Brewster to Stone, Pittsburgh, 68	40	
		Brewster to Auxier, Louisville, 28	56	
		Brewster to Sheppard, Lenox, 52	52	
		Brewster to De Zouche & Co., Philadelphia, 45	30	
		Brewster to Orme, Philadelphia, 50	30	
		Brewster to Oliver, jr., New York, 61	40	
		Brewster from Zabriskie, Phœnix, Ariz., 14	1 50	
		Simons from Howe, Saint Louis, 30	60	
		Ewing to Otis Bros., New York, 41	30	
	17.	Brewster to Speer, Atlanta, Ga., 24	50	
		Brewster to Dezouche, Philadelphia, 9	15	
	18.	Brewster from Zabriskie, Phœnix, Ariz., 17	1 50,	
		Simons from Howe, Saint Louis, 24	50	
	19.	Brewster to Searle, Saint Paul, Minn., 21	75	
		Brewster to Holstein, Indianapolis, 111	2 22	
		Simons to Elrin, Madison, Ind., 28	56	
		Brewster to Holstein, Indianapolis, 127	2 54	
		Brewster to Gosling, San Antonio, Tex., 79	3 16	
	20.	Brewster to Cassidy, Philadelphia, 194	1 05	
		Brewster to Newell, Olympia, Washington, 43	3 30	
		Brewster to Holstein, Indianapolis, 59	1 18	
		Brewster to Gosling, San Antonio, Tex., 52	2 08	
		Brewster to Melton, Charleston, S. C., 29	58	

1883.		Western Union Telegraph Company—Continued.		
Oct.	20.	Young to Smith, Denver, Col, 23	$1 00	
		Young to Russell, Little Rock, 28	84	
		Brewster from Holstein, Indianapolis, 60	1 20	
		Simons from Howe, Madison, Ind., 38	76	
	22.	Brewster to Keogh, Statesville, N. C., 24	25	
		Young to Keogh, Statesville, N. C., 42	42	
		Brewster from Newell, Olympia, Wahsington, 49	3 90	
	23.	Brewster to Smith, Huntsville, Ala., 33	66	
		Ewing to Lyon, Atlanta, Ga., 23	50	
	24.	Ewing to Bowman, New Orleans, 33	92	
		Ewing to Romose, Atlanta, 31	62	
		Brewster to Nightingale, Helena, Mont., 40	2 40	
		Brewster to Smith, Birmingham, Ala., 34	68	
		Brewster to Dezouche, Philadelphia, 13	15	
		Brewster to Nickerson, Philadelphia, 85	50	
		Brewster to Nickerson, Philadelphia, 28	20	
		Brewster from Smith, Huntsville, 27	54	
		Brewster from Nightingale, Helena, Mont., 21	1 50	
	25.	Brewster to Cassiday, Harrisburg, 75	45	
		Brewster from Cassiday, Philadelphia, 70	45	
		Brewster from Nickerson, Philadelphia, 25	20	
		Brewster to Dubois, Malad, Idaho, 31	1 55	
		Brewster from Dubois, Malad, Idaho, 51	2 60	
		Brewster from White, Malad, Idaho, 56	2 80	
		Brewster from Morgan, Malad, Idaho, 24	1 25	
		Graves to assistant United States treasurer, San Francisco, 38	2 66	
	26.	Brewster to McClain, Nashville, 17	50	
		Brewster to Lyon, Nashville, 39	78	
		Brewster to Tillman, Nashville, 15	50	
		Brewster to Crosby, Helena, Mont., 38	2 28	
		Brewster from Crosby, Helena, Mont., 28	1 68	
	27.	Brewster to Dezouche & Co., Philadelphia, 26	20	
		Brewster from Crosby, Helena, Mont., 106	6 36	
	29.	Brewster to Cassiday, Harrisburg, 17	15	
		Ewing to Otis Bros. Co., New York, 15	15	
		Brewster from Cassiday, Philadelphia, 26	20	
	30.	Brewster to Elstner, Shreveport, 102	3 06	
		Brewster to Reeves, Saint Joseph, 42	1 68	
	31.	Brewster to McDougall, Auburn, N. Y., 22	25	
		Brewster to Leonard, New Orleans, 136	4 08	
		Brewster from Leonard, New Orleans, 25	60	
		Brewster from Crosby, Helena, 40	2 40	
		Young to Crosby, Helena, 39	2 34	
		Young to Root, New York, 11	15	
		Ker to Cassiday, Philadelphia, 11	15	
				$119 19
		For telegraphing during the month of November, 1883, as per following statement, viz:		
Nov.	1.	Brewster to Searle, Saint Paul, 32	96	
		Brewster to Tilman, Nashville, 18	50	
		Brewster from Baldwin Bros. & Co., New York, 5	15	
	2.	Brewster to Richards, Cincinnati, 61	1 22	
		Brewster from Richards, Cincinnati, 23	40	
	3.	Brewster to Dixon, Providence, 50	30	
		Brewster to Paschal, Austin, Tex., 103	4 12	
		Brewster from Paschal, Austin, Tex., 36	1 44	
		Brewster from Richards, Cincinnati, 28	49	
	5.	Brewster to Morrell, Galveston, 58	2 32	
		Brewster to Paschal, Galveston, 76	3 04	
		Brewster from Paschal, Galveston, 37	1 48	
	7.	Brewster to Crosby, Helena, Mont., 57	3 42	
	8.	Brewster to Corbett, Virginia City, 39	2 34	
		Brewster to Weaks, Shreveport, La., 32	96	
	8.	Brewster from Weaks, Shreveport, La., 44	1 32	
		Ker to Bliss, New York, 22	20	
		Merrick to Bliss, New York, 20	15	
	9.	Brewster to Speer, Atlanta, 258	5 16	
		Young to Watts, Abingdon, Va., 18	25	
		Young from Watts, Abingdon, Va., 56	56	

1883.		Western Union Telegraph Company—Continued.		
Nov.	10.	Brewster to Goodspeed, Toledo, 97	$1 94	
	12.	Brewster to Hilborn, San Francisco, 25	1 50	
		Brewster to Elstner, Shreveport, 44	1 32	
		Brewster to Longstreet, Atlanta, 46	92	
	13.	Brewster to Hill, Jackson, Miss., 66	1 98	
		Brewster from Hill, Jackson, Miss., 20	75	
		Brewster to Melton, Charleston, S. C., 70	1 40	
		Brewster from Melton, Charleston, S. C., 22	50	
		Brewster from Hilborn, San Francisco, 29	1 90	
		Brewster from Lewis, Abingdon, Va., 93	93	
	14.	Brewster to Hilborn, San Francisco, 52	3 64	
		Brewster to East, Nashville, 45	90	
	15.	Brewster to Smith, Montgomery, Ala., 139	2 78	
		Brewster from Smith, Montgomery, Ala., 43	86	
		Brewster to Dundy, Omaha, 24	60	
		Brewster to Watts, Abingdon, Va., 14	25	
		Young from Watts, Abingdon, Va., 48	48	
	16.	Brewster from Keogh, Asheville, N. C., 35	35	
		Brewster from Keogh, Asheviile, N. C., 33	33	
	17.	Brewster to Bliss, New York, 80	45	
	19.	Brewster to Root, New York, 85	50	
		Brewster to Duzoeche, Philadelphia, 25	20	
		Brewster to Bowman, Pensacola, 99	1 98	
		Brewster to Cullom, Springfield, Ill., 36	72	
		Brewster from Bentley, Trinidad, Colo., 19	1 00	
	20.	Brewster to Cullom, Springfield, Ills., 30	60	
		Brewster to Ingalls, Atchison, Kans., 35	1 00	
	21.	Brewster to Bliss, New York, 62	40	
		Brewster to Sprague, Salt Lake, Utah, 46	2 30	
		Brewster to Russell, Little Rock, Ark., 25	72	
		Brewster from Russell, Little Rock, Ark., 79	2 37	
	22.	Brewster to Bliss, New York, 109	60	
		Brewster from Bliss, New York, 19	15	
	23.	Brewster to Bowman, New Orleans, 80	2 40	
		Brewster to Bowman, New Orleans, 265	7 95	
		Brewster to Bowman, New Orleans, 81	2 43	
		Brewster to Ballin, Montgomery, Ala., 95	1 90	
		Brewster to Russell, Little Rock, 33	99	
		Brewster to Campbell, Yankton, 67	2 01	
		Shellabarger to Burns, Galveston, 33	1 32	
	24.	Brewster to Bliss, New York, 28	20	
		Brewster from Bliss, New York, 36	25	
		Brewster from Bliss, New York, 105	60	
		Brewster from Root, New York, 27	20	
		Brewster from Manager Western Union Telegraph Company, New York, 29	20	
		Brewster from Speer, Atlanta, 54	1 08	
		Brewster from Reeves, Saint Joseph, 51	2 04	O-line 51
	25.	Shellabarger from Burns, Galveston, 46	1 84	
		Brewster to Bliss, New York, 164	90	
	26.	Brewster from Russell, Little Rock, 19	75	
		Brewster from Atkinson, Charleston, W. Va., 15	25	
		Brewster from Ballin, Montgomery, Ala., 78	1 56	
		Brewster from Speer, Columbia, S. C., 49	98	
		Phillips to Tarner, Springfield, Ills., 19	50	
		Phillips to Corbett, Carson City, Nev., 27	1 62	
		Cameron from Brewster, New York, 10	15	
	27.	Brewster to Smith, Montgomery, 151	3 02	
		Howe to Blair, New York, 20	15	
		Simons to Blair, New York, 23	20	
		Simons from Blair, New York, 25	20	
		Simons from Blair, New York, 15	15	
		Brooks to Bauer, Louisville, 44	88	
	29.	Brewster to Nickerson, Philadelphia, 39	25	
		Young to Graves, Philadelphia, 15	15	
	30.	Brewster to Foster, Indianapolis, 17	50	
		Brewster from Foster, Indianapolis, 39	78	
		Brewster to Hughes, Richmond, 30	30	
		Brewster to Elstner, Shreveport, La, 29	87	
		Simons to Holmes, Portland, Me., 38	76	

1883.		Western Union Telegraph Company.—Continued.		
Oct.	20.	United States Treasurer from Smith, United States marshal, Denver, Colo., 33	$1 32	
				$108 78
		For telegraphing during the month of December, 1883, as per following statement, viz:		
Dec.	1.	Brewster to White, Boise City, Idaho, 23	2 06	
	3.	Brewster to Leake, Chicago, 62	1 24	
		Blair to Davis, New York, 14	15	
	4.	Brewster to Boyd, Greensborough, N. C., 77	77	
		Brewster to Boyd, Greensborough, N. C., 24	25	
		Brewster from Boyd, Greensborough, N. C., 77	77	
		Brewster to Lewis, Madison, Wis., 28	56	
		Brewster from Leake, Chicago, 54	1 08	
	6.	Brewster to Deming, Harrisburg, 84	45	
	7.	Cameron from Brewster, Philadelphia, 34	25	
	8.	Brewster to Richards, Columbus, Ohio, 30	30	
		Brewster to Elstner, Shreveport, La., 46	1 38	
		Cameron from Brewster, Philadelphia, 13	15	
	10.	Brewster to Auxier, Catlettsburg, Ky., 19	50	
		Brewster to Nickerson, Philadelphia, 40	25	
		Brewster to Leonard, New Orleans, 43	1 29	
		Brewster from Leonard, New Orleans, 59	1 77	
	11.	Brewster to Nickerson, Philadelphia, 15	15	
		Brewster to Deming, Harrisburg, 20	15	
		Brewster to Leonard, New Orleans, 85	2 55	
		Brewster from Deming, Chambersburg, 20	25	
		Brewster from Bentley, Denver, 26	1 04	
	12.	Brewster to Leonard, New Orleans, 189	5 67	
		Brewster from Leonard, New Orleans, 34	96	
		Brewster to Bliss, New York, 135	75	
	13.	Brewster to Allen, Yankton, Dak., 26	78	
		Brewster from Leonard, New Orleans, 74	2 22	
		Wells to Pleasants, Richmond, 22	25	
	14.	Brewster to manager Western Union Telegraph, New Orleans, 51	1 53	
		Brewster to Leonard, New Orleans, 906	27 18	
	15.	Brewster from Leonard, New Orleans, 35	1 00	
		Brewster to Duskin, Mobile, 57	1 71	
		Brewster to Crosby, Helena, Mont., 149	8 94	
	17.	Brewster from Crosby, Helena, Mont., 268	16 08	
		Brewster from Waddell, Richmond, 56	56	
	18.	Brewster to Crosby, Helena, Mont., 175	10 50	
		Brewster from Crosby, Helena, Mont., 50	3 00	
		Brewster from Crosby, Helena, Mont., 45	2 70	
		Brewster from Duskin, Mobile, 38	1 12	
		Brewster from Duskin, Mobile, 39	1 16	
		Brewster from Speer, Atlanta, 25	50	
		Brewster from Deming, Harrisburg, 36	25	
	19.	Wilson from Wallace, Carlisle, Pa., 46	30	
	20.	Brewster to Van Zile, Salt Lake, 34	1 70	
	21.	Brewster from Hilborn, San Francisco, 58	3 92	
		Phillips to Allen, Fargo, Dak., 24	1 00	
	22.	Phillips to Hilborn, San Francisco, 38	2 66	
		Attorney-General from Allen, Yankton, Dak., 48	1 44	
	24.	Cameron to Brewster, New Orleans, 21	60	
		Cameron from Brewster, New Orleans, 161	4 83	
		Stanton from Hester and H., Oxford, N. C., 20	15	
	25.	Cameron to Brewster, New Orleans, 28	72	
		Cameron from Brewster, New Orleans, 105	3 15	
		Cameron from Brewster, New Orleans, 94	2 82	
	26.	Cameron from Brewster, New Orleans, 54	1 62	
		Cameron to Brewster, New Orleans, 44	1 32	
		Phillips to Allen, Yankton, 38	1 14	
	28.	Phillips to Longstreet, Atlanta, 36	72	
		Phillips from Longstreet, Atlanta, 23	50	
		Cameron from Brewster, New Orleans, 45	1 35	
	29.	Cameron to Brewster, New Orleans, 24	60	
	31.	Phillips to Allen, Yankton, 26	78	
				135 54

1883.		Western Union Telegraph Company—Continued.		
		For telegraphing during month of October 1883, as per following statement, viz:		
Oct.	2.	Rayner to Cullom, Springfield, Ill, 32	$0 64	
		Rayner to Reeves, Bloomington, Ill, 33	66	
	4.	Rayner to Evans, Austin, Tex., 38	1 52	
		Rayner to Gosling, Austin, Tex., 38	1 52	
	5.	Rayner from Evans, San Antonio, 39	1 56	
	19.	Rayner to Reeves, Bloomington, Ill., 37	74	
				$6 64
		For telegraphing during month of November, 1883, as per statement, viz:		
Nov.	2.	Rayner to Lea, Jackson, Miss., 34	1 02	
	5.	Elmes to Dutton, New York, 16	15	
	7.	Rayner to Ellinger, Pittsburgh, 16	15	
	9.	Rayner to Wilson, Pittsburgh, 19	15	
		Rayner from Wilson, Pittsburgh, 8	15	
	12.	Rayner from Ellinger, Pittsburgh, 11	15	
	13.	Rayner to Benson, Pittsburgh, 74	45	
		Rayner from Benson, Pittsburgh, 34	25	
	15.	Rayner to Edgarton, Yankton, 30	90	
		Rayner to Lea, Jackson, Miss., 28	84	
		Rayner from Lea, Jackson, Miss., 16	75	
	16.	Rayner from Edgarton, Yankton, 24	75	
	30.	Rayner from Robinson, Raleigh, 41	41	
		Rayner to Robinson, Raleigh, 29	29	
				6 41
		For telegraphing during month of December, 1883, as per statement, viz:		
Dec.	1.	Solicitor from Campbell, Yankton, Dak., 34	1 12	
	4.	Rayner to Hilborn, San Francisco, 34	2 38	
	8.	Rayner to Cheney, Jacksonville, Fla., 36	72	
		Rayner to Cheney, Jacksonville, Fla., 33	66	
	17.	Rayner from Hernig, New Orleans, 50	1 50	
	19.	Rayner to Eggleston, Toledo, 37	74	
				7 12
		The Daily National Republican:		
Dec.	31.	For subscription from July 1, 1883, to December, 31, 1883		3 00
1884.		John Douglass:		
Jany.	15.	For removing snow in front of the Department of Justice building		1 00
1883.		Adams Express Company:		
		For freight charges for transportation of Government property as follows:		
Dec.	4.	For 1 box, Philadelphia, Pa., Department of Justice	$0 50	
	8.	For 1 box, Philadelphia, Pa., Department of Justice	25	
	22.	For 1 package, New York City, Department of Justice	40	
				1 15
		Adams Express Company:		
Nov.	14.	For 1 box from Philadelphia to Department of Justice	70	
		For 2 boxes to J. M. Queen & Co, Philadelphia	50	
	20.	For 1 package from Boston, A. J. Bentley	80	
	22.	For 1 box from Philadelphia to Department of Justice	40	
				2 40
		R. K. Helphenstine:		
July	6.	For 1 one chamois skin	75	
	10.	For ½ dozen hair brushes	6 00	
		For ½ dozen combs	3 00	
Nov.	10.	For 1 pint benzine	25	
Dec.	5.	For 1 chamois skin	75	
				10 75
1884.		Henry Coleman:		
Jan.	31.	For washing 22⅓ dozen towels during the month of January, 1884, at 30 cents per dozen		6 70
		Henry Neubeck:		
Jan.	21.	For fixing chest lock and making a key	$0 50	
		For opening a Yale lock and making a key	1 50	
				2 00

1884.		John Wells:		
Feb.	1.	For hauling 14 loads ashes from engine room of Department of Justice for the month of January, 1884, at 30 cents		$4 20
		Ellen Lucas:		
Jan.	31.	For washing for the use of the office of the Solicitor of the Treasury for January, 1884, 8½ dozen towels, at 30 cents per dozen		2 55
1883.		James B. Lambie:		
July	27.	For 17 key-tags, stamped, at 5 cents	$0 85	
		For 1 pair glass knobs	2 25	
Aug.	17.	For 2 gaskets, at 15 cents	30	
		For ½ peck fire-clay	25	
Sept.	1.	For 8 large screws, at 12 cents	96	
	11.	For 2⅛ pounds jute packing, at 12 cents	25	
	22.	For 2 taps, plug, and taper, ⅜, at 60 cents	1 20	
Oct.	2.	For 1 breast-drill and 7 drills	4 00	
	9.	For 1 compass saw	40	
	10.	For pair gas-pliers	1 25	
	12.	For 7 dozen files, assorted	20 80	
		For 1 set drills	35	
		For 1 pair gas-pliers	75	
		For 1 pair end-pliers	85	
		For 1 anvil	1 00	
		For 1 anvil	1 15	
		For 1 bench-vise	1 75	
		For 1 pair compass dividers	85	
		For 1 pair snips	1 85	
		For 3 dozen sheets emery cloth, at 75 cents	2 25	
		For 1 pair r. n. pliers	1 00	
		For 1 hack saw	1 75	
		For 1 auger bit	30	
	16.	For 2 hammer handles, at 10 cents	20	
		For 3 dozen file handles, at 40 cents	1 20	
		For ½ dozen file handles, at 40c	20	
		For 1 pair shears	35	
	27.	For 1 set pipe stocks and dies, ⅛ to 1 inch	12 00	
	30.	For 1 dozen small nuts	10	
	31.	For 1 pipe cutter	2 50	
				62 91
		Baltimore and Ohio Express:		
Dec.	17.	For expressage on package from New York	25	
1884.				
Jan.	16.	For expressage on package from New York	50	
				75
		The Evening Star Newspaper Company:		
Feb.	1.	For subscription to Evening Star from April 1 to October 20, 1883, for use of Department of Justice		2 94
1883.		Washington city post-office:		
Dec.	31.	For box-rent, postage on letters, &c., from October 1 to December 31, 1883		1 10
		Baltimore and Ohio Telegraph Company:		
		For transmission of telegrams, viz:		
July	30.	Rayner to Jewett, Chicago, 47	$0 94	
Aug.	1.	Rayner to Hall, Chicago, 91	1 82	
Sept.	29.	Young from Ewing, Washington Junction, 56	56	
Oct.	18.	Brewster to Meredith, Philadelphia, 99	55	
	22.	Ewing to Otis Bros., New York, 32	25	
		Cameron to Ker, Philadelphia, 65	40	
	25.	Brewster to Dezouche & Co., Philadelpia, 41	30	
	30.	Wilson to Dezouche & Co., Philadelpia, 32	25	
Nov.	2.	Ewing to Otis Bros., New York, 28	20	
				5 27
1884.		P. W. Doyle:		
Feb.	8.	For repairing slate and tin roof on Department of Justice building		15 00
1883.		Mutual District Messenger Company:		
Sept.	30.	For rental night watch box, September	$5 00	
		For messenger service during the month	2 10	
				7 10

1883.		Mutual District Messenger Company—Continued.		
Oct.	31.	For rental night watch box, October	$5 00	
		For messenger service during the month	1 70	
				$6 70
Nov.	30.	For rental night watch box, November, 1883	5 00	
		For messenger service during the month	1 40	
				6 40
Dec.	31.	For rental night watch box, December, 1883	5 00	
		For messenger service during the month	1 60	
				6 60
1884.				
Jan.	31.	For rental night watch box, January, 1884	5 00	
		For messenger service during the month	2 75	
				7 75
		Western Union Telegraph Company:		
		For telegraphing during month of January, 1884, as per following statement:		
Jan.	2.	Rayner to Eggleston, Cleveland, Ohio, 48	48	
		Robinson to Cross, New York, 16	15	
	4.	Robinson to Thomas, Hackettstown, 48	48	
	5.	Robinson to Thomas, Hackettstown, 1.28	1 28	
	7.	Robinson to Cross, New York, 20	15	
	9.	Robinson to Thomas, Hackettstown, 25	25	
		Robinson to Keasby, Newark, N. J., 17	15	
	10.	Robinson to Waddill, jr., Alexandria, Va., 25	25	
		Robinson from Waddill, jr., Alexandria, Va., 7	25	
	15.	Robinson to Townsend, Albany, 12	15	
				3 59
		Adams Express Company:		
		For freight charges for transportation of Government property as follows:		
Jan.	3.	For 1 package from Pittsburgh, R. Ballin	45	
	4.	For 1 package from New York, Department of Justice	30	
	9.	For 1 package from Philadelphia, Department of Justice	30	
	11.	For 1 package to Geo. B. Emory, Mobile, Ala	75	
	23.	For 1 package to S. G. Hilborn, San Francisco, Cal	1 75	
				3 55
1883.		W. D. Wyvill:		
Nov.	22.	For 3 pounds solder, at 75 cents; 30 pounds lead pipe, at $3	3 75	
		For 1 day's time plumber and assistant in ventilating urinal and sink	6 50	
Dec.	1.	For 1 grate basket, at $10; 1 blower to grate, at $2.50	12 50	
	19.	For 1 gallon lard oil, $1; 1 oil can, 50 cents	1 50	
	26.	For 1 fire pot, $1.25; charcoal, 15 cents	1 40	
	28.	For 1 set bricks to No. 25, Dew Drop, $2; 6 pieces mica, at 75 cents	2 75	
		For 16 pounds fire-boards, $4; 2 6-inch elbows, $1	5 00	
		For 1 joint 6-inch pipe, 50 cents; 1 joint 5-inch pipe, 40 cents	90	
		For polishing 2 stoves, $1.50; putting up 2 stoves, $2	3 50	
	29.	For 1 glass trap, $1; 2 pounds solder, 50 cents; 1 piece pipe and fittings, 75 cents	2 25	
		For 1 day's time plumber and assistant, in changing sink from telephone to messenger room	6 50	
		For 2 dampers, and putting in pipes, at 50 cents	1 00	
1884.				
Jan.	12.	For repairing hose-pipe cock, 25 cents; 1 grate, $1.25	1 50	
		For grate rest, 50 cents; 2 ash-pit doors, 75 cents; 1 foot, 25 cents	1 50	
		For repairing, polishing, and putting up No. 2, Model Light	4 00	
		For repairing fire-board, 50 cents; 1½ joints 6-inch pipe, 75 cents	1 25	
		For 2 elbows, $1; 1 damper, 25 cents; 1 flange, 15 cents	1 40	
		For 1 zinc-board, $1.50; 1 fire-board, $1; moving and putting up Howard stove, $1	3 50	
Feb.	1.	For 1 grate for No. 2, Model Light	1 50	
	6.	For 5 gallons sperm oil, $8.75; 5 gallons vaseline oil, $8.75	17 50	
		For 25 pounds cotton waste, at 14 cents	3 50	
				83 20

1884.		Charles A. Bruff:		
Feb.	14.	For repairing case door	$1 00	
		For supplying and putting on thimble lock	1 10	
	12.	For repairing table	3 50	
				$5 60
		Thos. Somerville & Sons:		
Jan.	28.	For lengthening and repairing iron poker		2 00
		Montague Procter:		
	31.	For 13 days' labor in rearranging books, &c., under direction of the librarian of the Department, at $1.50 per diem	19 50	
Feb.	16.	For 13 days' labor, under direction of the librarian of the Department, arranging books, &c., at $1.50 per diem.	19 50	
				39 00
		Baltimore and Ohio Telegraph Company:		
		For transmission of telegrams, viz:		
Jan.	8.	Reynolds to Cross, New York, 43		30
		Henry Coleman:		
Feb.	29.	For washing 20 1/2 dozen towels, during the month of February, 1884, at 30 cents per dozen		6 27
		J. Hall Semmes:		
Jan.	16.	For 6 brooms	$2 40	
		For 1 can Pratt's oil	55	
	19.	For 6 feather-dusters	5 40	
Feb.	1.	For 6 boxes tapers	1 50	
	16.	For 1 can Pratt's oil	55	
	28.	For 1 can Pratt's oil	55	
			10 95	
		Cr.		
		By 2 empty cans returned	50	
				10 45
		John Wells:		
Mar.	1.	For hauling 14 loads ashes from engine-room, Department of Justice, for month of February, 1884, at 30 cents		4 20
		Ellen Lucas:		
Feb.	29.	For washing, for the use of the office of the Solicitor of the Treasury, during the month of February, 1884, 5 1/2 dozen towels, at 30 cents per dozen		1 75
		Wyckoff, Seamans & Benedict:		
	19.	For 1 dozen copying ribbons (order No. 281)		9 00
		Thomas Donoghue:		
	29.	For 12 days' labor performed in the engine-room, Department of Justice, viz, February 18 to 29, inclusive, being 12 days, at the rate of $720 per annum		23 74
		John Douglass:		
Mar.	3.	For shoveling snow from pavement in front of Department of Justice		1 00
		H. P. Boyce:		
Feb.	28.	For 6 No. 1 union cabinets, at $9 per dozen	$4 50	
		For 100 rolls paper	11 25	
				15 75
		John Douglass:		
Mar.	6.	For shoveling snow from pavement in front of Department of Justice		$1 25
		Mutual District Messenger Company:		
Feb.	29.	For rental night-watch box, February, 1884		5 00
		William Willis:		
Mar.	11.	For hauling 1 load (93 packages) of books from Department of Justice to Smithsonian Institution		1 00
		Adams Express Company:		
		For transportation of Government property, as follows:		
Feb.	12.	For 1 package to Elihu Root, New York	$0 35	
	23.	For 1 package to George P. Sanger, Boston, Mass	45	
		For 1 package to W. H. Morrow, San Francisco, Cal	60	
				1 40

1884.		Herdic Phaeton Company, Samuel G. Eberly, treasurer:		
Feb.	2.	For 633 street-car tickets, for use of the messengers, Department of Justice while traveling on official business		$25 00
		J. W. Roundtree:		
Mar.	17.	For furnishing and putting in place 72 card, receivers*		3 50
		Baltimore and Ohio Telegraph Company:		
		For transmission of telegrams, viz:		
Feb.	21.	Clay to Brewster, Baltimore		15
		George W. Knox & Co.:		
Mar.	18.	For freight and charges on one package of books from B. Westermann & Co., New York		70
1883.		L. H. Schneider & Son:		
Aug.	3.	For one tack-hammer		20
1884.		Henry Coleman:		
Mar.	31.	For washing towels during month of March, 1884, 18½ dozen, at 30 cents		5 68
		D. Rickenbacher:		
Jan.	14.	For repairing clock, Room 20	$2 50	
	21.	For repairing clock, Room 22	4 00	
		For repairing clock, Room 7	3 50	
Mar.	19.	For setting the clocks	3 00	
	25.	For repairing a nickel clock	50	
				13 50
		John Wells:		
	31.	For hauling 14 loads ashes from engine-room, Department of Justice, for the month of March, 1884, at 30 cents		4 20
		Baltimore and Ohio Express:		
	3.	For expressage on one bundle from New York		90
		Ellen Lucas:		
	31.	For washing for the use of the office of the Solicitor of the Treasury during the month of March, 1884, eight dozen towels, at 30 cents per dozen		3 40
		Julius Baumgarten:		
Apr.	4.	For one fac-simile stamp for general agent		3 00
		Mutual District Messenger Company:		
Mar.	31.	For rental night-watch box, March, 1884		5 00
		Washington City post-office:		
	31.	For postage on letters from January 1 to March 31, 1884		83
1883.		Charles A. Bruff:		
Aug.	3.	For supplying and putting up towel-rack	$0 75	
		For supplying and putting on 2 drawer-locks	1 60	
	15.	For making 1 book and file case	40 00	
		For supplying and putting up hat and coat rack	3 25	
		For supplying and putting on 2 Yale locks on desk-drawers	4 50	
				50 10
		George Breitbarth:		
Oct.	—	For one revolving, leather-covered office chair (walnut), for pardon clerk's office		12 50
		H. O. Towles:		
July	28.	For 5-foot walnut tables	$15 00	
		For rattan arm-rocker	9 00	
				24 00
		Charles A. Bruff:		
Nov.	6.	For making and putting up desk and brackets	10 00	
		For opening and repairing desk and putting on 3–3 tumbler locks	5 75	
		For drawer and fitting 1 key	75	
	13.	For supplying and putting on 240 feet of weather-strip on 12 windows	31 20	
		For supplying and putting in 10 sash-cords	5 00	
		For — hours' time fitting ventilators	1 25	
	21.	For cleaning and putting in storm-windows	8 77	

* These card-receivers are tin frames for holding labels on the file boxes and cases in the room of John S. Blair (No. 9, third floor), assistant attorney.

1883.	Charles A. Bruff—Continued.		
Nov. 21.	For supplying and putting on 2 bronze-handle two-lettered door-plates and 2 bolts	$7 50	
	For supplying and putting on 1 air-spring	9 75	
22.	For covering raised desk	1 25	
	For making and covering raised desk	5 75	
			$16 75
	George Breitbarth:		
23.	For 1 mahogany fire-screen	35 00	
	For repairing fire-screen and plate-glass	12 50	
	For 1 key for mahogany table	1 00	
			48 50
	Charles A. Bruff:		
Dec. 4.	For repairing desk and fitting 2 keys	1 50	
	For repairing windows and putting in 3 sash-cords	3 00	
6.	For repairing 2 arm-chairs	4 50	
12.	For repairing desk and supplying hooks	40	
18.	For repairing desk and supplying hinges	65	
19.	For repairing desk and supplying hinges	65	
			10 70
28.	For putting in 4 sash-cords	2 00	
1884.			
Jan. 3.	For supplying material and 4 days' work for cabinet-maker, putting up closet, wainscoting and shelf, and repairing elevator door and sink	16 60	
	For 2 days' work for helper	3 00	
			21 60
1883.	D. J. McCarty:		
Dec. 18.	For one walnut file-case (record room)		110 00
1884.	Geo. Breitbarth:		
Jan. 4.	For one ebonized cabinet, containing 14 file-boxes, drawer, and center closet		125 00
	Charles A. Bruff:		
7.	For repairing door	$0 75	
	For repairing case and hanging doors, &c	1 50	
	For repairing lock and fitting key	40	
	For supplying and putting on lock	1 25	
	For repairing lock-drawer and fitting key	1 20	
	For repairing and varnishing up 1 map canopy	5 35	
			10 45

BOOKS FOR DEPARTMENT LIBRARY.

1883.	F. E. Northhouse:		
July 7.	For the works of James Abram Garfield, by B. A. Hinsdale, vols. 1 and 2, for Department library		8 50
	M. E. Mann:		
10.	For the Annual Encyclopedia, new series, vol. 7, 1882, for Department library		6 00
	F. G. Cowie:		
	For one copy "The Jeannette," &c., for Department library		6 00
	W. H. Morrison:		
2.	For Pennsylvania, vol. 96	$4 50	
	For Pennsylvania, vol. 98	4 00	
	For Alabama, vol. 67	4 50	
	For Law Review	1 00	
	For Flippin's C. C., vol. 2	6 00	
	For Massachusetts, vol. 132	3 50	
4.	For Blatchford, vol. 19	6 00	
	For Michigan, vol. 48	3 50	
	For Maryland, vol. 58	5 00	
6.	For Missouri, vol. 75	3 75	
	For 3 lawyers' ref. books	12 00	
	For 1 lawyer's ref. book, interleaved	5 50	
7.	For Hughes' C. C., vol. 4	6 00	
	For Encyclopedia, vol. 15	8 00	
	For N. Y. Ct. of Appeals, vol. 89	1 50	
	For Lawson's Concordance	7 50	
	For Law Review	1 00	

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July	10.	For Wisconsin, vol. 55	$3 00	
	12.	For Schouler on Executors	5 00	
		For Cohen on Admiralty	5 00	
	13.	For Lawrence's Decis., vol. 1	3 00	
		For McCrary, vol. 3	6 50	
		For Banning & Arden, vol. 5	9 50	
		For Florida, vol. 18	5 00	
	16.	For Indiana, vols. 81, 82, 83	12 00	
		For Oregon Digest	4 50	
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		For Jones & Spencer, vol. 48	6 00	
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		For U. S. Digest, vol. 13	6 00	
		For Law Review	1 00	
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		For Massachusetts, vol. 133	3 50	
	24.	For Maryland, vol. 59	5 00	
		For Maine, vol. 74	4 50	
		For Bissell, vol. 10	6 50	
	26.	Bouvier's Law Dictionary, 2 vols	11 00	
		Rapeljie's Law Dictionary, 2 vols	11 00	
			———	$226 75
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		For 1 New York Annotated Code, 1883	7 50	
		For 1 New York Penal and Criminal Code, in 1 vol	4 00	
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		For Wisconsin, vols. 54, 55	6 00	
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	18.	For 1 Nature and Life	2 00	
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		For ½ ream bill cap	2 80	
		For 31 reams letter paper, at $2.22	68 82	
		For 4 reams note paper, at $1.50	6 00	
		For 4½ reams note paper, at $4	18 00	
		For 1½ reams note paper, at $5	7 50	
		For 2 boxes envelopes, at $2	4 00	
		For 1,000 envelopes, at $3	3 00	
		For 500 No. 12 cloth-lined envelopes	15 00	
		For 500 envelopes	6 00	
		For 375 envelopes	3 00	
		For 250 envelopes	2 00	
	13.	For 1,500 envelopes, at $8 per M	12 00	
		For 1,350 envelopes	10 12	
		For 1,350 envelopes	10 12	
		For 1 ream extra heavy blotting-paper	30 00	
		For 25 sheets extra heavy blotting-paper	2 00	
		For 12 gross steel pens, at 75 cents	9 00	
		For 10 gross steel pens, at $1	10 00	
		For 2 boxes steel pens, at 75 cents	1 50	
		For 1 box steel pens, at $1.25	1 25	

1883.		J. Bradley Adams—Continued.	
July	13.	For 1 box steel pens, at $1.60	$1 60
		For 1 box steel pens, at $1.50	1 50
		For 16 quarts black ink, at $1	16 00
		For 18 quarts black ink, at 60 cents	10 80
		For 1 bottle India ink	20
		For 6 bottles ink, at 50 cents	3 00
		For 6 bottles carmine ink	2 00
		For 12 bottles carmine ink	5 00
		For 6 bottles carmine ink	1 80
		For 30 bottles mucilage, at 65 cents	19 50
		For 1 fountain mucilage	50
		For 31 knife-erasers, at 75 cents	23 25
		For 1¾ reams manila paper, at $12	21 00
		For 30 dozen black lead pencils, at 75 cents	22 50
		For 2 dozen colored pencils, at 75 cents	1 50
		For 1½ dozen colored pencils	1 67
		For 6 rubber erasers, at 35 cents	2 10
		For 14 rubber erasers, at 25 cents	3 50
		For 11 boxes leads for automatic pencils, at 30 cents	3 30
		For 7 boxes leads for automatic pencils, at 25 cents	1 75
		For 3 boxes leads for automatic pencils, at 50 cents	1 50
		For 2 dozen boxes pins, at $1.20	2 40
		For 3 dozen boxes pins, at $1.25	3 75
	19.	For 23 automatic pencils, at 25 cents	5 75
		For 38 automatic pencils, at 35 cents	13 30
		For 2 green pencils, at 10 cents	20
		For 2½ dozen pen-holders, at $1	2 50
		For ½ dozen pen-holders, rubber, at 25 cents	1 50
		For 2½ dozen pen-holders, rubber, at $4 per dozen	10 00
		For 1 dozen 2¾-inch cut-glass inkstands, at $1.50	18 00
		For 1 double cut-glass inkstand	6 00
		For 1 dozen boxes rubber bands	4 00
		For 12 gross rubber bands	12 00
		For 1 gross rubber bands	1 50
		For 1 dozen boxes rubber bands	2 50
		For 1 dozen boxes rubber bands	4 00
		For 12 gross rubber bands	2 50
		For 12 gross rubber bands	7 20
		For 3 gross rubber bands	75
		For 1 gross rubber bands	1 75
		For 1 gross rubber bands	1 25
		For 1 gross rubber bands	90
		For 33 gross rubber bands	33 00
		For 6 blotting-pads	6 00
		For 6 paste-brushes, at 15 cents	90
		For 18 balls twine, at 20 cents	3 60
		For 5 pairs shears, at $1	5 00
		For 1 pair shears, at 50 cents	50
		For 2 pairs shears, at $1.25	2 50
		For 1 paper-folder	75
		For 1 hektograph	9 50
		For 13 table baskets, at $1.50	19 50
		For 1 note-binder	75
		For 1 letter-binder	95
		For 6 packs blank cards	1 50
	19.	For 1,000 packages blank cards	4 00
		For 2 waste-paper baskets	1 25
		For 6 waste-paper baskets	7 50
	16.	For 18 ink-extractors, at 25 cents	4 50
		For 6 boxes seals, at 25 cents	1 50
		For 12 sponges	1 35
		For 12 letter-press books, at $1.50	18 00
		For 3 quires tissue paper	60
		For 5 maps, at $2.20	11 00
		For 6 scrap-books, at $1.50	9 00
		For 2 scrap-books, at 90 cents	1 80
Aug.	1.	For 1 ruler, at $1.50	1 50
		For 1 ruler, at $1	1 00
		For 1 memorandum book	40
		For 1 blank book	1 25

1883.		J. Bradley Adams—Continued.		
Aug.	1.	For 1 blank book	$1 00	
		For 1 cash book	6 00	
		For 1 ruling-pen	1 50	
		For 6 thumb-tacks	50	
		For 1 stick India ink	1 50	
	9.	For 4 sheets drawing paper, at 30 cents	1 20	
		For 1 dozen sponge-cups	1 50	
		For ½ dozen Moore's blotters	4 50	
		For 1 glass pen-tray	1 00	
	15.	For ½ dozen boxes paper-fasteners	3 00	
		For 1 pair letter-scales	3 00	
		For 1 letter-press	20 00	
		For 1 paper-file	50	
	23.	For 2 letter-clips	50	
		For 1 dozen sealing wax	2 50	
		For 1 staple-press	1 50	
	30.	For 6 boxes paper-fasteners, at 35 cents	2 10	
		For 6 boxes paper-fasteners, at 50 cents	3 00	
		For 1 yard tracing linen	1 00	
		For ½ ream copy paper	75	
		For 1 dozen spools red tape	6 00	
	25.	For 5 M envelopes, at $4	20 00	
		For 10 M envelopes, at $3	30 00	
		For 15 M envelopes, at $2	30 00	
		For 12 dozen pencils, at 75 cents	9 00	
		For 10 dozen pencils, at 75 cents	7 50	
		For 72 gross assorted bands, at $1	72 00	
		For 12 dozen rubber pen-holders, at $3	36 00	
		For 12 dozen wood pen-holders, at $1	12 00	
Aug.	2.	For 6 bottles Stephens' ink	6 00	
		For 24 bottles M. and N. ink, at 50 cents	12 00	
		For 15 reams type-paper, at $2.22	33 00	
		For 10 reams note paper, linen, at $4	40 00	
		For 10 reams foolscap paper, at $3	30 00	
		For 2 reams bill paper, at $5	10 00	
		For 10 reams legal paper, at $3	30 00	
		For 3 reams manila paper, at $12	36 00	
		For 3 reams envelope paper at $4	12 00	
		For 12 square inkstands, at $1.50	18 00	
	15.	For 12 sponge-cups, at 25 cents	3 00	
		For 3 dozen rolls tape, at $3	9 00	
		For 6 dozen ruling pens, at $1.50	9 00	
		For 1 blank book	4 00	
		For 1 dozen tablets	1 00	
		For 1 dozen paper weights	2 00	
	24.	For 1 dozen pen-racks	2 50	
Aug.	24.	For 6 pounds sealing-wax	4 50	
		For 1,000 Bristol cards	3 00	
		For 12 memorandum books, at 50 cents	6 00	
		For 12 balls twine, at 40 cents	4 80	
		For 12 balls twine, large, at 50 cents	6 00	
		For 12 paper-folders, at 75 cents	9 00	
	31.	For 12 automatic pencils	3 00	
		For 12 automatic leads	3 00	
		For 1 ream blotting-paper	30 00	
		For 24 quarts mucilage, at 50 cents	12 00	
			———	$555 60

HORSES AND WAGONS.

		John H. Clark:		
July	31.	For one month's livery of 2 horses, ending July 31, 1883, at $25 per month each	50 00	
		Murray & Barker:		
		For shoeing horses for the month of July, 1883	8 50	
		John H. Clark:		
Aug.	31.	For one month's livery of 2 horses, ending August 31, 1883, at $25 per month each horse	50 00	
		John H. McDermott & Bros.:		
		For repairs to Department of Justice carriage during month of August, 1883, as per voucher	263 50	

1883.		Murray & Barker:		
Aug.	10.	For removing 1 shoe (horseshoe)	$0 25	
	11.	For 2 shoes	1 00	
	25.	For 4 shoes	2 00	
				$3 25
		John H. Clark:		
Sept.	30.	For the livery of 2 horses for the month of September, 1883	50 00	
Oct.	31.	For one month's livery of 2 horses, ending October 31, 1883, at $25 per month	50 00	
		For 24 days' livery of 1 horse, ending October 31, 1883, at $25 per month	20 00	
				120 00
		Murray & Barker:		
Sept.	1.	For removing 2 horseshoes	1 00	
Oct.	4.	For 4 new shoes	2 00	
	20.	For 4 new shoes	2 00	
Nov.	1.	For 2 removes (horseshoes)	50	
	3.	For 4 shoes	2 00	
	5.	For 4 shoes	2 00	
	7.	For 2 shoes	1 00	
	12.	For 1 remove (horseshoe)	25	
	21.	For 4 shoes	2 00	
	27.	For 4 shoes	2 00	
				14 75
		John H. Clark:		
Nov.	30.	For one month's livery of 3 horses ending this date, at $25 per month each		75 00
		Francis Miller:		
Nov.	9.	For 1 stable lantern	$1 00	
		For 1 gallon lard oil and can, for use in carriage-house in rear of Department building	1 40	
				2 40
		For Department horses.		
		C. Becker:		
July	10.	For 1 halter-strap, $1; (17) repairing harness, $2.25	3 25	
Oct.	10.	For washing, oiling, and blacking, $4; and repairing harness, $3.50	7 50	
	18.	1 horse cover, $7; 1 padded surcingle, $1	8 00	
	19.	For 1 heavy linen lined horse cover	5 00	
		For 1 halter-strap, 75 cents; (24) repairing horse cover, $1.25	2 00	
Nov.	12.	For 1 fawn blanket, $12; 1 fawn hood, $8; 1 brown street blanket, $12.50	32 50	
		For 1 whalebone whip, $3.50; (16) 1 plush robe, $65	68 50	
	16.	For 1 fawn hood, $10; (22) 1 horse clipper, $3.50; 1 gas singing-lamp	18 50	
		For 1 padded surcingle, 75 cents; 1 fawn kersey horse blanket, $6	6 75	
		For 20 feet rubber hose to singeing-lamp	2 40	
	23.	For 1 pair clipping shears, $2; 1 mane brush, $1.50	3 50	
	24.	For repairing harness	75	
				158 65
		John H. Clark:		
Dec.	31.	For one month's livery of 3 horses, ending December 31, 1883, at $25 per month		75 00
		For horses belonging to Department.		
		Murray & Barker:		
Dec.	12.	For 6 shoes	$3 00	
	17.	For 2 shoes and 2 removes and sharpening shoes	1 63	
	24.	For 4 removes and sharpening shoes	1 25	
	26.	For 2 shoes and 2 removes and sharpening shoes	1 62	
				7 50
		John McDermott & Bros.:		
Oct.	25.	For new wrought-iron hitching post with rings	5 00	
		For 4 chairs and springs	2 00	
Dec.	26.	For repairing and regulating 8 axle-washers	6 75	
		For repairing and settling caps and steps	2 75	

1883.		John McDermott & Bros.—Continued.		
Dec.	26.	For repairing dash, and two new trace bolts	$3 50	
		For tucking body and gearing with and coloring back with paint, and varnishing	30 00	
				$50 00
1884.		John H. Clark:		
Jan.	31.	For one month's livery of 3 horses, ending January 31, 1884		75 00
		Murray & Barker:		
Jan.	5.	For 4 shoes, sharp	2 00	
	15.	For 4 shoes, sharp	2 00	
	16.	For 4 shoes, sharp	2 00	
	18.	For 4 shoes, sharp	2 00	
				8 00
Feb.	9.	For 4 shoes	2 00	
	23.	For 4 shoes	2 00	
				4 00
		John H. Clark:		
	29.	For one month's livery of 3 horses, at the rate of $25 per month.		75 00
1883.		C. Becker:		
Dec.	19.	For 1 rubber horse-cover	$5 50	
1884.				
Jan.	4.	For repairing bridle	50	
	4.	For general repairs to set of harness	2 00	
	4.	For 1 pair gilt tenets	2 00	
	4.	For washing, oiling, and blacking harness	2 75	
	7.	For 3 padded surcingles, at 50 cents	1 50	
	7.	For 2 linen wool-lined blankets	10 00	
	7.	For 1 linen cotton-lined blanket	4 00	
	19.	For 1 embossed rubber horse-cover	5 50	
	29.	For repairing harness	85	
				34 60
		Murray & Barker:		
Mar.	5.	For 8 shoes	4 00	
	29.	For pulling shoes off horse at stable	50	
				4 50
		John H. Clark:		
Mar.	15.	For use of horse this day	3 00	
	16.	For use of horse this day	3 00	
	17.	For use of horse this day	3 00	
	19.	For use of horse this day	3 00	
	20.	For use of horse this day	3 00	
	21.	For use of horse this day	3 00	
	22.	For use of horse this day	3 00	
	23.	For use of horse this day	3 00	
	24.	For use of horse this day	3 00	
	25.	For use of horse this day	3 00	
	26.	For use of horse this day	3 00	
	27.	For use of horse this day	3 00	
	28.	For use of horse this day	3 00	
	29.	For use of horse this day	3 00	
	31.	For one month's livery of 3 horses, ending this date, at $25	75 00	
				117 00

[This service was charged for in consequence of the sickness of one of the Department horses, which could not be used during the period from March 15 to 29, inclusive.]

Amount expended	$12,178 14
In hands of disbursing clerk	431 86
In the United States Treasury	250 00
Amount of appropriation	12,860 00

EXHIBIT H.—*Report of the librarian.*

DEPARTMENT OF JUSTICE,
Washington, November 1, 1884.

SIR: I have the honor to transmit herewith the annual report relating to the library of the Department of Justice.

During the fiscal year, July 1, 1883, to June 30, 1884, there were purchased:

	Volumes.
United States Supreme Court Reports	14
United States Circuit and District Court Reports	10
State Reports	73
English, Scotch, Irish, and Canadian Reports	67
United States and State Digests	9
English and Canadian Digests	3
State Statutes	6
Works on jurisprudence	70
Encyclopædias	3
Dictionaries (four)	6
Manuals	4
Almanacs and Year Books—English and foreign	4
Periodicals	2
Biographies	3
Total	274

There were received from the Secretary of State and distributed the following:

	No. copies received.	No. copies distributed.
Revised Statutes of the United States, second edition, 1878	25	20
Supplement to Revised Statutes United States, Vol. 1	25	20
United States Statutes at Large:		
Vol. 18	15	10
Vol. 19	15	10
Vol. 20	15	8
Vol. 21	15	8
Vol. 22	450	440

Received from the Secretary of War: Official Records of the War of the Rebellion, Series I, Vols. 9 and 10, Parts 1 and 2, 50 copies of each. About one-half of these copies have been distributed.

Received from the Secretary of the Interior: United States Supreme Court Reports, Vols. 107, 108, 109, and 110; 150 copies of each volume; 136 copies of each volume distributed. There were also distributed one copy each of Vols. 104 and 105.

Received 16 copies United States Court of Claims Reports, Vol. 18; all distributed.

Received from the Government Printing Office: Assassination of President Garfield (Guiteau trial), 155 sets, 3 vols. each; 143 sets distributed. Record in second star-route trials, 281 sets, 4 vols. each; 145 sets distributed. 1,500 copies of the Register of the Department of Justice for 1883; 985 copies distributed. 1,600 copies of the Annual Report of the Attorney-General for 1883; 1,300 copies distributed. Lawrence's Decisions, 215 copies; 124 copies distributed.

There were also distributed Opinions of the Attorneys-General, Vols. 13, 14, 15, and 16—15 copies of each volume, and 28 copies of Annual Report of the Attorney-General for years 1870 to 1883, except 1882.

Respectfully submitted.

M. B. CUMMINGS.
Librarian.

Hon. B. H. BREWSTER,
Attorney-General.

EXHIBIT J.—*Report of the Architect of the Capitol.*

ARCHITECT'S OFFICE, UNITED STATES CAPITOL,
Washington, D. C., September 27, 1884.

SIR: I have the honor to report that during the last fiscal year the court-house in this city has been kept in good repair.

Several improvements have been made to it, consisting principally of vestibule doorways in the basement story, to exclude the cold air of winter; a room has been fitted up with closets for the uniforms of bailiffs and other court attendants; and steam coils connected with the boilers in the new portion of the building have been placed in the room occupied by the marshal.

The court-rooms in the old portion of the building have been painted and otherwise improved.

I again beg leave to call your attention to the fact that there are many unoccupied rooms in this building, which could be fitted up for business purposes at a comparatively slight expense.

Very respectfully, your obedient servant,

EDWARD CLARK,
Architect United States Capitol.

Hon. BENJAMIN H. BREWSTER,
Attorney-General United States.

EXHIBIT K.—*Statement of expenses of United States courts incurred in* 1880, 1881, *and* 1882, *and paid in the fiscal year* 1884.

INCURRED IN 1882.

District.	Marshals.	Jurors.	Witnesses.	Support of prisoners.	Miscellaneous.	Clerk.	Commissioners.	Rent.	Total.
Alabama, northern district	$29 82		$587 01						$616 83
Alabama, middle district							$37 20		37 20
Azizona				$24 15		$50 00			74 15
Arkansas, eastern district				146 75					146 75
Arkansas, western district	3,333 95			855 37	$337 00				4,526 32
California					303 20				303 20
Colorado					10 00		11 10		21 10
Dakota			21 60				121 70	$375	518 30
District of Columbia					487 25		52 25		539 50
Florida, northern district					101 21	17 75			118 96
Georgia, northern district	2,336 80		2 85	2 70	38 50		23 40	250	2,654 25
Idaho				1,164 19	10 75			40	1,214 94
Iowa	542 27						20 65	150	712 92
Kansas			20 20	37 20			15 00		72 40
Kentucky	41 75			146 20	224 63				412 58
Louisiana, eastern district			4 50						4 50
Louisiana, western district				68 00					68 00
Maryland					10 00				10 00
Massachusetts						2 00			2 00
Michigan, eastern district	137 11				19 50				156 61
Michigan, western district							14 20		14 20
Minnesota	2,169 36		81 60		127 45		25 00		2,403 41
Mississippi, southern district			51 45	4 00					55 45

EXHIBIT K.—*Statement of expenses of United States courts, &c.*—Continued.

INCURRED IN 1882.

Districts.	Marshals.	Jurors.	Witnesses.	Support of prisoners.	Miscellaneous.	Clerk.	Commissioners.	Rent.	Total.
Missouri, western district	$2,439 37						$20 45		$2,459 82
Montana	1,262 33		$29 00					$75	1,366 33
Nebraska	52 12								52 12
New Hampshire	7 50					$22 65			30 15
New Mexico		$34 20			$15 00		40 00	114	233 20
New York, northern district				$615 46					615 46
New York, southern district		12 00		34 00			12 00		58 00
North Carolina, eastern district	36 49		1 50		28 00		2 25		68·24
North Carolina, western district				56 15	41 50		221 65		319 30
Ohio, northern district					20 00		5 00		25 00
Ohio, southern district							70 00		70 00
Pennsylvania, western district	50 00			285 00				100	435 00
South Carolina		10 00							10 00
Tennessee, eastern district	17 90						30 75		48 65
Tennessee, middle district				84 20					84 20
Tennessee, western district							37 00		37 00
Texas, eastern district					4 00				4 00
Texas, northern district		452 40					7 35	300	759 75
Texas, western district		9 00		100 00	20 75				129 75
Utah	254 35				808 15				1,062 50
Vermont							10 20		10 20
Virginia, eastern district				50					50
Virginia, western district	15 08	86 40	627 30	820 01	40 00				1,588 79
Washington	65 50					280 00			345 50
West Virginia				11 00	54 60		32 80		98 40
Wisconsin, eastern district	156 00						55 00		211 00
Total	12,947 70	604 00	1,427 01	4,454 88	2,731 49	372 40	864 95	1,404	24,806 43

INCURRED IN 1881.

	Marshals.
Alabama, northern district	1,285 58
Ohio, southern district	226 94
Total	1,512 52

INCURRED IN 1880.

	Marshal.	Miscellaneous.	Rents.	Total.
Alabama, northern district	$383 97			$383 97
Alabama, middle district		$153 91		153 91
Washington		4 00		4 00
New Mexico			$60 00	60 00
Total	383 97	157 91	60 00	601 88

EXHIBIT L.—*Statement of the expenses of United States courts incurred in* 1883 *and paid in the fiscal year* 1884.

District.	Marshals.	Jurors.	Witnesses.	Support of prisoners.	Miscellaneous.	Attorneys.	Clerks.	Commissioners.	Rents.	Total.
Alabama, northern district	$227 69	$518 60	$7,169 80	$564 83	$16 90		$321 81		$250 00	$9,069 63
Alabama, middle district										
Alabama, southern district	2,807 73	1,981 25	2,018 00	431 91	1,285 83		1,255 95	$1,229 45	375 00	11,385 12
Arizona	1,126 61			1,585 87	1,128 55			92 15		3,933 18
Arkansas, eastern district	23 20			541 50	39 35		1,042 10	411 60		2,057 75
Arkansas, western district	2,000 00	259 00	2,215 00		1,031 20			1,949 75		7,454 95
California	343 43	2,829 60		735 00			1,368 49	1,140 65		6,417 17
Colorado					869 50			236 30	550 00	1,655 80
Connecticut	556 23		14 40	195 10				153 65		919 38
Dakota									1,675 00	1,675 00
Delaware	54 36				94 54		536 20	36 50		721 60
District of Columbia	1,863 67		2,026 22		159 95			162 30		4,212 14
Florida, northern district	22 40						180 00		475 00	677 40
Florida, southern district								25 20	263 00	288 20
Georgia, northern district	3,000 00		3,898 35	5,720 05	132 61			2,698 55		15,449 56
Georgia, southern district		874 63	2,039 50					10 00	250 00	3,174 18
Idaho				610 00		$58 00			54 94	722 94
Illinois, northern district				789 55	72 00			211 75		1,073 30
Illinois, southern district				858 00				719 10		1,577 10
Indiana		27 50		141 70				238 75		407 95
Iowa, northern district	2,543 53	383 60	1,080 25	586 75	313 45			800 10	20 00	5,727 68
Iowa, southern district	570 32	568 10		247 24	713 51			636 48	550 00	3,285 65
Kansas	1,412 48		3,733 19	474 50	20 00		130 30	240 40	150 00	6,160 87
Kentucky	2,236 50		2,470 25	988 00	20 00		25 00	1,823 61	125 00	7,688 36
Louisiana, eastern district	261 37	43 82		124 55	84 00			577 53		1,091 27
Louisiana, western district	474 62							30 65	348 33	853 60
Maine	12 59			136 50						149 09
Maryland	1,094 87			1,285 60	243 06		500 65	318 10		3,442 28
Massachusetts		4 40	1,957 35	1,331 70	1,300 07			645 30		5,238 82
Michigan, eastern district	150 90		14 25				409 26	207 40		781 81
Michigan, western district	91 27			68 25	2 25			198 95	125 00	485 72
Minnesota	633 43		1,381 03	115 75	80 30			381 70		2,592 21
Mississippi, northern district							955 40		220 00	1,175 40
Mississippi, southern district		50								50
Missouri, eastern district	188 15			40 80	343 09			577 25		1,149 29
Missouri western district	448 72			253 67	41 33		99 15	293 26	925 00	2,061 13
Montana	921 00			281 53		10 00	237 90		720 00	2,170 43
Nebraska		459 60		45 50				222 70		727 80
Nevada									600 00	600 00
New Hampshire	74 54	391 00		64 75				63 20	50 00	643 49
New Jersey	103 76			620 37				571 30	72 00	1,367 43
New Mexico		1,803 00	644 00	1,600 00	263 20		1,035 01	91 16		5,436 37
New York, northern district			19 30	2,560 82				2,958 77	300 00	5,838 89
New York, southern district		2,926 00		144 77	729 85			579 15		4,379 77

New York, eastern district					200 00				833 33		1,033 33
North Carolina, eastern district	1,801 84	451 75	2,324 07	110 40	369 00		151 95	268 95	372 58		5,850 54
North Carolina, western district			1,300 00		10 00		598 68	1,284 37	50 00		3,243 05
Ohio, northern district	606 21			84 00	20 00			288 80	300 00		1,299 01
Ohio, southern district		194 40	4 55	96 80	719 26				250 00		1,265 01
Oregon	111 90			375 00	253 20			346 35			1,086 45
Pennsylvania, eastern district			156 89	1,247 05	2,496 55			454 25			4,354 74
Pennsylvania, western district			59 30				419 75	93 75	250 00		822 80
Rhode Island				39 00							39 00
South Carolina				2,482 90	22 50		497 98	219 05	125 00		3,347 43
Tennessee, eastern district	3,434 10		718 70	432 22	350 00			1,316 15			6,251 17
Tennessee, middle district	1,737 51		28 00		450 00			287 55			2,503 06
Tennessee, western district		381 00	172 00			79 38	2,059 25	319 60	581 25		3,592 48
Texas, eastern district	2,653 16			40 00	7 05				400 00		3,100 21
Texas, northern district		26 00	603 00		150 00			608 30	1,300 00		2,687 30
Texas, western district				275 85					975 00		1,250 85
Utah	3,441 73				2,627 48				1,150 00		7,219 21
Vermont				367 81	180 00			11 00			558 81
Virginia, eastern district	312 72		1,202 50		359 30		1,131 85	191 00			3,197 37
Virginia, western district	2,935 02		2,100 92	254 16	531 90		143 40	623 00	812 00		7,400 40
Washington	1,500 00	1,700 00	200 00	3,371 00	911 46		10 00	44 00			7,736 46
West Virginia	2,049 68	9 25	163 01	660 00	102 40		1,181 22	149 40			4,314 96
Wisconsin, eastern district		1,999 10	53 00	43 21	140 00			220 95	125 00		2,581 26
Wisconsin, western district				48 25			490 70	691 75			1,230 70
Wyoming							94 85		850 00		944 85
Total	43,827 24	17,832 15	39,766 83	33,072 21	18,884 64	147 38	14,876 85	27,950 93	16,472 43		212,830 66

EXHIBIT M.—*Statement of expenses of United States courts incurred and paid in the fiscal year* 1884.

District.	Marshals.	Jurors.	Witnesses.	Support of prisoners.	Miscellaneous.	Attorneys.	Clerks.	Commissioners.	Rents.	Total.
Alabama, northern district	$17,300 00	$4,000 00	$21,000 00	$1,110 00	$1,280 00	$3,277 51	$3,486 40	$4,519 04	$750 00	$56,722 95
Alabama, middle district	16,750 00	2,400 00	8,500 00	500 00	2,082 05	5,487 48	1,411 10	3,768 88	1,125 00	42,024 51
Alabama, southern district	7,300 00	2,500 00	8,000 00	1,000 00	1,000 00	1,514 60	1,017 80	2,452 45	.....	24,784 85
Arizona	18,900 00	8,400 00	9,100 00	5,304 37	2,187 80	3,383 40	1,972 10	616 80	750 00	50,614 47
Arkansas, eastern district	10,000 00	5,250 00	9,250 00	2,000 00	2,900 00	3,961 50	1,151 02	764 85	.....	35,277 37
Arkansas, western district	31,500 00	18,500 00	44,500 00	15,500 00	9,603 80	6,610 00	4,622 63	4,397 10	.....	135,233 53
California	14,230 00	10,750 00	11,500 00	6,233 50	10,211 45	8,750 00	4,678 85	1,582 15	.....	67,935 95
Colorado	4,500 00	8,500 00	10,500 00	2,480 00	4,291 30	12,105 08	50 70	634 17	1,875 00	44,936 25
Connecticut	1,950 00	1,000 00	1,300 00	878 34	425 00	1,201 80	440 70	39 70	.....	7,235 54
Dakota	19,400 00	12,600 00	28,736 50	4,500 00	3,295 60	3,679 28	1,792 50	1,494 20	.....	75,498 08
Delaware	1,200 00	1,527 00	650 00	450 00	1,721 00	620 00	618 85	13 55	.....	6,800 40
District of Columbia	9,000 00	19,500 00	8,541 00	.....	35,414 83	31,475 21	.....	123 80	.....	104,054 84
United States jail	.....	.....	.....	47,425 30	.....	.....	.....	.....	.....	47,425 30
Supreme Court United States	.....	.....	.....	.....	28,500 00	.....	.....	.....	.....	28,500 00
Florida, northern district	5,450 00	3,500 00	6,350 00	730 00	2,476 00	2,015 60	808 67	659 55	1,225 00	23,214 82
Florida, southern district	980 00	2,438 00	980 00	290 00	1,491 00	365 60	416 40	88 75	790 00	7,839 75
Georgia, northern district	18,500 00	9,000 00	25,000 00	6,500 00	4,321 48	9,055 00	7,666 75	6,765 86	.....	86,809 09
Georgia, southern district	11,000 00	7,500 00	9,500 00	1,500 00	3,915 00	3,306 90	2,746 85	1,238 90	750 00	41,457 65
Idaho	9,500 00	5,900 00	2,525 00	3,242 00	1,900 00	1,715 00	954 64	125 00	460 00	26,321 64
Illinois, northern district	4,500 00	9,060 00	4,351 00	1,556 35	5,574 00	4,959 57	1,108 80	653 90	.....	31,763 62
Illinois, southern district	17,018 70	12,000 00	24,000 00	4,325 20	5,125 00	5,240 20	4,462 18	1,345 00	.....	73,516 28
Indiana	8,400 00	6,720 00	5,450 00	2,694 15	2,890 00	2,559 40	1,707 30	1,060 30	.....	31,481 15
Iowa, northern district	10,200 00	7,400 00	8,200 00	1,700 00	2,280 00	3,872 40	1,128 55	1,038 80	150 00	35,969 75
Iowa, southern district	11,500 00	8,700 00	8,500 00	1,012 82	4,195 00	4,527 59	1,970 15	1,482 80	750 00	42,638 36
Kansas	6,500 00	6,500 00	18,630 00	3,729 00	1,807 07	13,534 55	3,210 39	1,605 16	150 00	55,666 17
Kentucky	19,600 00	15,060 00	21,500 00	7,000 00	1,330 00	5,026 00	2,970 40	2,808 60	125 00	75,420 00
Louisiana, eastern district	5,000 00	6,500 00	1,675 00	1,200 00	4,727 00	4,512 50	260 00	1,134 06	.....	25,008 56
Louisiana, western district	2,857 00	3,290 00	3,050 00	629 00	2,025 00	653 60	278 05	61 80	970 00	13,814 45
Maine	3,800 00	4,360 00	4,630 00	1,328 75	2,500 00	1,366 00	866 64	662 85	.....	19,514 24
Maryland	5,450 00	3,540 00	3,300 00	3,034 52	3,095 00	2,215 00	1,276 85	1,396 90	.....	23,308 27
Massachusetts	8,500 00	8,500 00	9,000 00	3,630 00	9,025 00	5,330 00	2,337 28	3,187 35	.....	49,509 63
Michigan, eastern district	4,100 00	5,952 00	1,750 00	2,500 00	3,040 00	2,463 00	1,002 55	646 25	.....	21,453 80
Michigan, western district	4,000 00	4,400 00	2,200 00	624 00	2,548 00	3,295 05	1,971 36	726 83	312 48	20,077 72
Minnesota	7,500 00	6,060 00	9,000 00	1,271 50	1,419 50	4,869 10	1,275 25	907 50	.....	32,302 85
Mississippi, northern district	3,757 00	8,900 00	4,000 00	500 00	2,330 00	3,089 10	1,003 30	11 65	360 00	23,951 05
Mississippi, southern district	1,770 00	4,000 00	2,600 00	650 00	1,140 00	1,062 00	573 31	13 40	5 00	11,813 71
Missouri, eastern district	8,000 00	6,600 00	4,000 00	2,031 00	5,300 06	5,505 00	1,839 15	1,134 65	.....	34,409 86
Missouri, western district	14,000 00	10,200 00	16,400 00	4,144 85	4,255 00	3,651 38	2,793 00	1,959 80	2,925 00	60,328 23
Montana	4,500 00	5,000 00	3,617 40	7,300 00	2,306 45	1,211 80	51 20	37 15	495 00	24,519 00
Nebraska	9,000 00	5,360 00	2,875 00	837 50	2,264 00	2,389 60	1,542 45	582 10	.....	24,850 65
Nevada	4,000 00	2,800 00	750 00	417 00	765 00	1,152 40	.....	26 10	.....	9,910 50
New Hampshire	1,400 00	2,700 00	900 00	591 80	1,500 00	606 60	731 70	123 65	150 00	8,703 75
New Jersey	4,150 00	3,590 00	3,350 00	2,158 75	2,400 00	1,578 00	1,500 90	463 75	.....	19,191 40
New Mexico	15,700 00	12,080 00	5,900 25	1,500 00	3,400 00	4,636 80	3,534 22	458 45	336 00	47,545 72

New York, northern district	14,550 00	3,220 00	20,250 00	4,080 41	2,880 00	8,014 40	2,013 92	7,345 75	300 00	62,654 48
New York, southern district	9,000 00	11,000 00	6,042 50	4,200 00	20,603 39	16,053 44	1,168 89	1,763 00	.....	69,831 22
New York, eastern district	4,000 00	1,608 00	780 00	560 00	5,926 40	3,275 00	651 35	942 20	9,166 63	26,909 58
North Carolina, eastern district	1,900 00	3,205 00	2,400 00	245 00	1,126 80	3,536 20	2,559 66	498 45	1,237 50	16,708 61
North Carolina, western district	19,331 40	7,000 00	13,770 00	6,000 00	1,795 00	8,113 90	2,023 57	4,460 25	100 00	62,594 12
Ohio, northern district	4,000 00	7,790 00	3,000 00	1,048 76	4,115 00	2,104 60	2,906 93	604 15	900 00	26,469 44
Ohio, southern district	6,350 00	5,150 00	3,100 00	1,759 20	5,600 00	4,480 00	907 36	749 70	750 00	28,846 26
Oregon	21,000 00	4,040 00	7,100 00	3,561 55	4,591 00	4,980 00	4,227 90	1,311 15	.....	50,811 60
Pennsylvania, eastern district	5,180 00	8,780 00	5,340 00	5,023 80	5,304 00	8,325 00	565 00	523 75	.....	39,041 55
Pennsylvania, western district	8,600 00	15,545 00	10,757 00	1,900 00	4,280 25	6,546 30	2,223 60	1,130 35	50 00	51,032 50
Rhode Island	1,500 00	1,113 00	270 00	232 86	2,750 00	1,318 60	881 05	7 75	.....	8,073 26
South Carolina	13,000 00	16,428 00	50,700 00	7,300 00	6,801 20	12,028 11	3,553 45	5,566 00	250 00	115,626 76
Tennessee, eastern district	18,000 00	5,500 00	18,000 00	2,750 00	700 00	8,717 75	4,395 98	4,092 20	.....	62,155 93
Tennessee, middle district	10,000 00	6,300 00	20,500 00	2,800 00	2,200 00	5,333 20	4,202 02	3,354 70	.....	54,689 92
Tennessee, western	3,500 00	2,400 00	1,700 00	1,000 00	2,990 00	3,721 60	1,471 00	305 10	1,722 09	18,810 39
Texas, eastern district	3,900 00	5,500 00	5,500 00	805 00	2,650 00	1,594 10	3,162 99	560 50	1,000 00	24,672 59
Texas, northern district	9,200 00	6,660 00	7,550 00	1,795 00	2,225 00	2,028 29	1,313 88	1,761 20	1,831 50	34,364 87
Texas, western district	8,100 00	7,240 00	7,460 00	3,700 00	2,805 25	2,026 80	3,223 02	744 35	1,800 00	37,099 42
Utah	6,300 00	5,320 00	1,800 00	400 00	445 00	2,941 40	1,139 55	101 95	1,950 00	20,397 90
Vermont	1,535 57	1,356 00	969 00	694 15	770 00	510 40	82 80	41 05	.....	5,958 97
Virginia, eastern district	4,600 00	4,300 00	4,120 00	750 00	4,612 00	2,569 60	2,179 25	115 15	.....	23,246 00
Virginia, western district	14,500 00	6,255 00	9,155 00	2,100 00	1,807 00	2,594 40	3,842 05	1,696 96	313 00	42,263 41
Washington	4,450 00	5,440 00	1,700 00	11,254 00	2,643 70	1,478 20	989 35	24 40	.....	27,979 65
West Virginia	13,084 00	14,567 00	25,500 00	3,768 25	6,400 80	5,895 20	2,357 40	618 15	375 00	72,565 80
Wisconsin, eastern district	4,600 00	4,500 00	1,775 00	825 26	1,730 00	1,604 20	640 40	640 85	.....	16,315 71
Wisconsin, western district	7,400 00	3,450 00	3,300 00	578 75	1,750 00	2,924 00	456 86	276 65	.....	20,136 26
Wyoming	1,192 00	486 00	1,500 00	7,114 00	846 30	697 20	836 95	.....	950 00	13,622 45
Total	601,435 67	456,690 00	609,599 65	232,255 69	294,605 48	311,242 49	127,207 12	92,049 26	37,149 20	2,762,234 36

EXHIBIT N*a*.—*Detailed statement of the amounts paid out of the appropriation for expenses of United States courts*, 1879 *and prior years, act of August* 5, 1882, *and deficiency appropriation act of March* 3, 1883, *during the fiscal year* 1884.

Date.	To whom paid.	Amount.
1883.		
Sept. 29	J. H. Sloss	$1,936 14
Oct. 20	J. F. Lewis	4,382 29
1884.		
Jan. 3	J. Sherman, jr	44 00
3	do	600 00
8	R. L. Hutchinson	17 40
April 5	J. C. Ullery	422 37
	Total	7,402 20

EXHIBIT N*b*.—*Detailed statement of the amounts paid out of the appropriation for payment of special deputy marshals at Congressional elections*, 1881 *and prior years, during the fiscal year* 1884.

District.	Amount paid to each district.	Amount of repayment.
California	$5 00	
Indiana	5 00	$363 00
Louisiana, eastern district	25 00	
Maryland	25 00	360 00
New Jersey	30 00	
New York, southern district		3,440 00
Ohio, southern district		25 00
Pennsylvania, eastern district		410 00
Virginia, eastern district		60 00
Total	90 00	4,658 00

EXHIBIT N*c*.—*Statement of amounts paid for fees of supervisors of elections, section* 3689, *Revised Statutes, for the Congressional elections of November*, 1882, *during the fiscal year* 1884.

State.	Amount paid.		Amount of repayment (State).
	District.	State.	
Alabama, northern district	$572 00	$1,032 77	
Alabama, southern district	460 77		
Florida, northern district	159 30	159 30	
Louisiana, eastern district	5 00	5 00	
Maryland	10 00	10 00	$75 00
Massachusetts	2,380 00	2,380 00	15 00
New York, northern district	5,246 49	14,708 00	280 00
New York, eastern district	9,461 86		
Pennsylvania, western district	10 00	10 00	10 00
South Carolina	110 00	110 00	
Tennessee, western district	9 00	9 00	
Texas, eastern district			20 00
Virginia, western district	85 00	85 00	
Total	18,509 42	18,509 42	400 00

EXHIBIT O.—*Statement showing the number of assistants to the United States attorneys, their employment, and amount of compensation approved from December 1, 1883, to December 1, 1884, required by sections 385 and 195, Revised Statutes.*

REGULAR ASSISTANTS.

Districts.	Names.	Compensation.	Remarks.
Alabama, northern district...	L. W. Day	*$1,000 00	To March 13, 1884.
Alabama, middle district.....	C. E. Woods	*1,500 00	To April 1, 1884.
Alabama, middle and northern districts.	....do	*2,000 00	After April 1, 1884.
Arizona	W. S. McPheeters..	Fees.	
Do.....	E. W. Wells.....	Fees.	
Do.....	A. C. Baker	Fees.	
Do	Jerry Milloy.....	Fees.	
Do	J. N. Anderson	Fees.	
Arkansas, eastern district...	M. L. York	*1,200 00	To July 15; resigned.
Arkansas, western district ..	G. A. Grace	*1,200 00	
California	Carroll Cook	*2,500 00	
Do.....	Ward McAllister..	*2,000 00	To August 23, 1884; res'd.
Colorado.....	Isaac N. Stevens...	*1,500 00	From January 23, 1884.
Dakota	C. S. Palmer	*1,500 00	To March 18, 1884.
Do.....	J. C. Murphy	*1,500 00	From March 28, 1884.
Do.....	....do	*2,000 00	After August 1, 1884.
Georgia, northern district ...	J. C. Jenkins	*1,200 00	To January 1, 1884.
Do.....	... do	*1,500 00	After January 1, 1884. June 2, 1884, resigned.
Do.....	Will Haight	*2,000 00	From October 15, 1884.
Idaho.....	F. Wood	Fees.	
Illinois, northern district....	J. A. Baldwin	*1,500 00	To December 17, 1883.
Do.....	J. Saint Clair Boal.	*2,200 00	
Do.....	C. M. Dawes	*2,200 00	From February 15, 1884.
Illinois, southern district....	E. T. Roe	*1,500 00	
Indiana.....	C. H. McCarer	*1,800 00	
Iowa, northern district.....	DeW. C. Cram	*1,200 00 / *1,500 00	To September 1, 1884. After September 1, 1884.
Iowa, southern district.	W. T. Rankin	*1,000 00	
Do.....	F. H. Perry	*900 00	
Kansas	C. B. Smith	*1,500 00	
Kentucky	George Du Relle...	*1,000 00	
Louisiana, eastern district...	J. W. Gurley.....	*2,500 00	
Maryland.....	A. M. Rogers	*1,200 00	
Massachusetts.....	C. Almy, jr.....	*2,000 00	
Do.....	W. K. Blodgett, jr..	*1,200 00	From October 1, 1883.
Michigan, eastern district ...	J. W. Finney	2,000 00	
Michigan, western district ..	W. W. Hyde	Fees.	
Mississippi, northern and southern districts.	H. R. Ware	*1,200 00	
Minnesota	C. A. Congdon	Fees.	
Missouri, eastern district....	C. G. B. Drummond	*1,800 00	
Do	E. Smith	*1,200 00	
Missouri, western district...	Ross Guffin	*1,500 00	
Montana.....	George C. Randolph	Fees.	
Do.....	J. S. Walker	None.	
Nebraska.....	E. M. Bartlett.....	*1,000 00	From February 13, 1884.
New Jersey	G. M. Keasbey	*800 00	
New York, northern district.	W. O. S. Woodward	*2,250 00	
Do.....	Alden Chester.....	*2,250 00	
New York, southern district.	S. B. Clarke.....	*3,500 00	
Do.....	B. B. Foster.....	*3,500 00	
Do.....	J. P. Clarke.....	*2,000 00	
Do.....	G. E. P. Howard ...	*2,000 00	
Do.....	W. W. Adams	*2,000 00	
Do.....	C. A. Hess.....	*1,500 00	To March 1, 1884; res'd.
Do.....	H. N. Tift.....	*1,500 00	After March 1, 1884.
New York, eastern district..	F. W. Angel	*1,800 00	
North Carolina, eastern district.	Willis Bagley.....	*1,000 00	
North Carolina, western district.	W. S. Ball	*1,700 00	
Ohio, southern district	D. K. Watson.....	*1,200 00	
Do.....	Henry Hooper.....	*2,000 00	
Pennsylvania, eastern district.	J. S. Nickerson	*2,500 00	
Do.....	H. P. Brown.....	*3,000 00	
Do.....	Hood Gilpin	*3,000 00	
Pennsylvania, western district.	George C. Wilson..	*2,500 00	
Do.....	David Cameron....	*1,250 00	
South Carolina	John Wingate.....	*2,000 00	
Do.....	R. B. Carpenter	*1,500 00	From July 1, 1884.
Tennessee, eastern district ..	J. P. Smith.....	*1,200 00	

* Per annum.

EXHIBIT O.—*Statement showing the number of assistants to the United States attorneys, &c.* —Continued.

REGULAR ASSISTANTS—Continued.

Districts.	Names.	Compensation.	Remarks.
Tennessee, middle district...	J. R. Dillon	*1, 200 00	
Tennessee, western district .	J. B. Clough	*1, 500 00	
Texas, western district.....	George Paschal ...	*1, 200 00	From May 5, 1884.
Utah	Zera Snow	*1, 000 00	
Do	E. T. Sprague	*1, 500 00	To May 1, 1884.
West Virginia.....	G. W. Patton	*300 00	
Wisconsin, western district .	O. B. Thomas	*3, 500 00	
Washington Territory.....	C. H. Hanford.....	Fees.	

SPECIAL ASSISTANTS.

California.....	W. W. Bishop.....	$1, 000 00		Final compensation in opium cases.
Do	A. L. Rhodes	2, 000 00		Title to Mare Island.
Do.....	Philip Teare.....	400 00		Case *v.* Dodge, Martin, and Burchard.
Do.....	Brownson & Wells.	200 00		Mission Indians.
Colorado.....	W. S. Decker	5, 000 00 4, 500 00	$9, 500 00	Case *v.* Southern Colorado Coal and Mining Company.
Do.....	C. D. Gurley	300 00		First National Bank, Georgetown.
District of Columbia.....	Frank Irvine	126 40 122 20 123 63	372 23	Detective cases.
Do.....	W. W. Ker.....	1, 200 00 1, 452 55	$2,652 55	Case *v.* Kellogg, &c., from November 1 to December 15, 1883; from April 1 to May 2, 1884.
Do.....	W. S. Perry	69 33		Forfeited recognizances.
Do.....	J. K. Porter.....	†5, 000 00		In Guiteau case.
Do.....	W. D. Davidge.....	†5, 000 00		Do.
Do.....	D. S. Walker	750 00		Case *v.* Bryant & Craig.
Do.....	George Bliss	7, 200 00		Star-route cases, from April, 6, 1883, to November 19 1883.
Do	....do	1, 600 00		Star-route cases from November 19, 1883, to February 19, 1884.
Do.....	R. Coyle	75 00		Case *v.* Commissioners of the District of Columbia.
Do.....	R. T. Merrick	5, 500 00		Star-route cases.
Do.....	H. H. Wells.....	2, 000 00		Detective cases.
Do.....	S. H. Reynolds	634 89		Star-route cases.
Kansas	W. J. Buchan	3, 500 00		Lands Black Bob Indians.
Do.....	John Hutchings ...	4, 060 00		Do.
Louisiana, eastern district...	A. Burchard	1, 060 00 510 00	1, 570 00	Frauds on United States.
Ohio, southern district.....	H. R. Probasco.....	400 00		Collecting old judgments.
South Carolina.....	B. Butterworth	1, 500 00		Election cases.
Texas, northern district.....	E. R. Marshall	210 49		Removing 97 cases to United States courts.
West Virginia.....	J. H. Furguson.....	3, 000 00		Case *v.* Keller.

* Per annum. † Approved.

EXHIBIT P.—*Report of the Solicitor of the Treasury.*

DEPARTMENT OF JUSTICE,
OFFICE OF THE SOLICITOR OF THE TREASURY,
Washington, D. C., November 8, 1884.

SIR: I have the honor to transmit herewith seven tabular statements, exhibiting the amount character, and results of the litigation under my

direction for the fiscal year ending June 30, 1884, shown by the docket entries of this office.

These tables embrace, respectively—

1. Suits on transcripts of accounts of defaulting public officers, excepting those of the Post-Office Department, adjusted by the accounting officers of the Treasury Department.

2. Post-office suits, embracing those against officers of the Post-Office Department, and cases of fines, penalties, and forfeitures for violation of the postal laws.

3. Suits on custom-house bonds.

4. Suits for the recovery of fines, penalties, and forfeitures under the customs-revenue and navigation laws.

5. Suits against collectors of customs and other officers or agents of the Government, excepting internal-revenue officers, for refund of duties and acts done in the line of their official duty.

6. Suits in which the United States is a party or is interested, not embraced in the other classes.

7. A general summary or abstract of all the other tables.

An examination of the tables will show that the whole number of suits commenced within the year was 3,216, of which 68 were of class 1, for the recovery of $349,678.98; 355 were of class 2, for the recovery of $37,112.85; 27 were of class 3, for the recovery of $53,075.39; 206 were of class 4, for the recovery of $62,046.27; 811 were of class 5, and 1,749 were of class 6, for the recovery of $1,152,390.37; making a total sued for, as reported, of $1,654,303.86.

Of the whole number of suits brought, 1,335 were decided in favor of the United States, 29 were adversely decided, 436 were settled and dismissed, in 12, penalties were remitted by the Secretary of the Treasury, leaving 1,404 still pending.

Of those pending at the commencement of the year, 422 were decided for the United States, 81 were decided adversely, 841 were settled and dismissed, and in 1 penalties were remitted by the Secretary of the Treasury.

The entire number of suits decided or otherwise disposed of during the year was 3,157; the whole amount for which judgments were obtained, exclusive of decrees *in rem*, was $490,826.31; and the entire amount collected from all sources was $356,207.23.

The number of cases in which offers of compromise were pending received during the fiscal year was 194, involving the sum of $2,259,-371.97. The number of offers accepted was 70, involving the sum of $379,667.29; amount accepted, $51,206.56. The number of offers rejected was 49, involving the sum of $516,137.02; amount rejected, $56,471.91. The number of offers pending at the close of the year was 75, involving the sum of $1,363,567.66; amount offered in cases pending, $61,509.95.

A statement of the lands under charge of this office acquired in payment of debt during the fiscal year, as well as of those sold during that period, and of those to which the title has been relinquished, appears in an exhibit hereto.

It is proper for me to state that I entered upon the discharge of the duties of this office early in July last, and consequently the report of business herewith submitted embraces that of the fiscal year ending June 30, 1884, all transacted prior to my appointment. It will be observed, however, that the best interests of the Government were always considered and duly subserved.

My experience as Solicitor, brief as it has been, warrants me in making some suggestions which, if adopted, will, I am confident, enhance

the efficiency of the public service, secure a greater sense of responsibility upon the part of the Government officers, and a prompter and speedier settlement of their accounts.

A very potential reason for the failure to collect a larger proportion of the judgments recovered against defaulting officers is that the accounts of such officers are not more promptly adjusted and placed in the hands of the proper officers of the Government for collection. Years often elapse after the retirement of an officer from the service before his accounts are adjusted. In the mean time he may die or become insolvent; and his sureties be so situated that nothing can be collected from them.

When I state that some such accounts have been sent to this office for suit, the transactions which they represent having taken place more than a quarter of a century before, and the officer having been retired for as long a period, it will be apparent that the evil is a serious one and calls loudly for a remedy.

In addition to the losses entailed upon the Government by the death, insolvency, &c., of the principal and his sureties, great injustice often results to sureties themselves from these delays in settling such accounts. Knowing that their principal has retired from office, and for a series of years hearing no complaints, they naturally suppose that moneys intrusted to him have been duly disbursed and honestly accounted for, and other duties legally performed. They therefore take no steps looking towards securing themselves against any delinquency. Years afterwards, when the circumstances surrounding them are so changed that they cannot protect themselves, they are confronted by a statement of accounts showing a deficit, and are called upon to make it good. Need any argument be offered to demonstrate what gross injustice may often be done to sureties, who are entitled to be honorably and justly dealt with by the Government?

I would therefore respectfully suggest that it would be wise to provide that the accounts of all officers shall be audited within a period of two years after the retirement of the respective incumbent from his office, and that a limitation should be provided within which sureties must be called upon to make good the default of their principals.

The condition of the civil business in which the Government is interested, pending in the courts of the District of Columbia, is of such a character as to justify special mention.

The dockets of this office show that for years past but few civil actions of which this office has cognizance, in which the Government was party plaintiff and to which a defense has been interposed, have been tried.

Upon inquiry of the district attorney of the United States for the District of Columbia, he states, "as to all these cases, that the force in this (his) office is utterly insufficient to attend properly to the criminal business alone;" that—

> The attention of Congress seems never to have been sufficiently attracted to the difference between the duties of the United States attorney for the District of Columbia and those of United States attorneys elsewhere.
>
> Here the District attorney is charged with the prosecution of all offenses known to the common law, from petit larceny up to murder, while throughout the States the prosecution of offenders charged with such crimes is intrusted to the State prosecutor, and the attorney of the United States has nothing to do with them.
>
> Owing to the fact that this is the seat of Government, there is an immense amount of business of the highest importance which falls to the lot of the District attorney here.
>
> The important prosecutions conducted in the District, growing out of frauds perpetrated upon the Government by officials here and others in collusion with them, of late years, are well known. * * * The inadequate force in this office heretofore

has necessitated the employment in these cases of special counsel, and it will be impossible to transact the business of the office in the future without either the appointment of special counsel in all such cases or an increase in the regular force. The latter alternative is far the more desirable on every account. * * * Every person connected with the office is overworked, and yet the business cannot be kept up. * * *

Notwithstanding these extraordinary efforts on the part of the District attorney and his assistants, *they have found it necessary to almost entirely neglect the civil business of the office to attend to the more pressing duties on the criminal side of the courts.* * * *

The police court, the grand jury, the criminal court, and the court of general term are in session in this District almost daily, and at times two criminal courts are in session.

It has been found necessary most of the time to allow the grand jury to go on without the assistance of any person from the district attorney's office, owing to the fact that he and his assistants are usually engaged elsewhere.

Certainly nothing can be plainer than that, if the legal business of the Government is to be promptly transacted, some efficient remedy must be provided for the evils which the district attorney so graphically sets forth. Depriving his office of the force actually necessary for the prompt and efficient discharge of its varied and onerous duties is not only ill-advised economy, but unwise in every particular, and ought to be remedied without delay.

I would therefore respectfully recommend that the district attorney be authorized to employ a competent assistant at a stated salary, whose duty it shall be to take charge of all the civil business in which the Government is interested in the courts of the District of Columbia; or, if this be not thought advisable, that the Solicitor of the Treasury be charged with the care of and the prosecution or defense of such business, so that it may hereafter be promptly disposed of.

The attention of the then honorable Secretary of the Treasury was called to the importance of a prompt settlement of the accounts of the officers of the Government by the proper Bureaus of his Department in the annual report of Hon. George F. Talbot of the year 1876, then Solicitor of the Treasury, who also submitted for the consideration of that officer a draft of a bill which in his opinion would remedy the evils he described. Believing that if the provisions of that bill should be enacted into law the efficiency of the public service would be greatly subserved, I take the liberty of submitting the draft of a bill similar in its features for your consideration, trusting, if you agree with me in regard to the necessity or propriety of the legislation proposed, you will submit the same to Congress for such action as they may see fit to take.

I have the honor to be, with the highest consideration, your obedient servant,

HENRY S. NEAL,
Solicitor of the Treasury.

Hon. BENJAMIN HARRIS BREWSTER,
Attorney-General of the United States.

AN ACT relating to public accounts and claims.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That all claims against the United States which the accounting officers of the Treasury or the heads of any Department or Bureau are authorized to examine and decide shall be barred unless presented within five years from the time the same accrued.

SEC. 2. Claims which would be barred by the operation of this act, or within two years after the same goes into effect, may be presented within three years from the date of this act, but not afterwards.

SEC. 3. No claim shall be decided or considered by any head of a Department, or

of a Bureau, or by any accounting officers of the Treasury, while the same is pending before Congress by petition, bill, or otherwise, but shall be suspended until final action by Congress has been had thereon.

SEC. 4. All bonds given to secure contracts with the United States, and all official bonds of public officers, except of postmasters, marshals, clerks, and other officers of the courts of the United States, shall be submitted to the Solicitor of the Treasury for examination and approval.

SEC. 5. Suits against sureties on bonds given to the United States shall be barred unless brought within five years after the termination of the office of the principal therein, if the bond be an official bond, or unless brought within five years from condition broken, if the bond be a bond given by any person to whom has been awarded a contract with the United States.

SEC. 6. Where a public officer has given bond to the United States, or where any person has become a contractor with the United States, and has given bond to perform the contract, and a new additional or strengthening bond is given to the United States by such public officer or contractor, the sureties on such new additional or strengthening bond, together with the sureties on the original bond of such officer or contractor, shall be liable to the extent of the penalties of such bonds, respectively, for the balance found due on final adjustment of the account of such officer or contractor, and suit may be brought against the sureties on either bond of such officer or contractor to recover said balance. And when an officer shall be reappointed to an office, and shall give a new bond to secure a faithful performance of the duties thereof, the sureties on such bond shall be held liable for any default or indebtedness of their principal existing at the time of the execution of such bond, as well as for any defalcations occurring during the term of office for which such bond was given: *Provided, however*, That the liability of the sureties on the bond given for a faithful performance of the duties of the preceding term of office shall in no wise be lessened or impaired.

SEC. 7. When suit is brought by the United States against any person accountable for public money, or against the sureties on the official bond of such person, or against any person in a contract with the United States, express or implied, or against the sureties of such person on his bond for the faithful performance of such contract, a transcript of the accounts of such person from the books and proceedings of the Treasury Department, certified by the Auditor charged with the examination of such accounts, and authenticated under the seal of the Treasury Department, or, in case of accounts relative to the public lands, certified by the Commissioner of the General Land Office, and authenticated under the seal of the Interior Department, shall be admitted as evidence in the trial of such suit, and the court trying the suit shall grant judgment and award execution accordingly. Copies of all bonds, contracts, or other papers relating to or in connection with the settlement of public accounts, certified by the Auditor, or, in case of accounts relative to public lands, by the Commissioner, to be true copies of the originals on file and authenticated under the seal of the Treasury Department, or Interior Department, as the case may be, must be annexed to such transcripts, and shall have equal validity and be entitled to the same degree of credit as the original. If suit is brought on a bond or other sealed instrument, and the defendant pleads *non est factum*, verifying such plea by his oath, the court may, on motion of defendant, if it appears necessary for the attainment of justice, require the production of the original bond or other sealed instrument.

SEC. 8. The accounting officers, of the Treasury shall adjust and settle the final accounts of public officers, or persons to whom contracts have been awarded, within two years from the expiration of the term of office of the officer, or within two years from the time the contract has been completed or default made therein.

SEC. 9. No written testimony of any witness shall be admitted as evidence in relation to any claim or account against the United States, pending before the head of any Department or Bureau other than the Commissioner of Pensions, or before the accounting officers of the Treasury, unless the same has been taken on oath before a judge or clerk of a court of the United States, or a commissioner of the circuit court of the United States, or a notary public, upon interrogatories and cross-interrogatories previously filed on behalf of the Government and the claimant in the office of the Department or Bureau before which such claim is pending.

SEC. 10. It shall be the duty of the Attorney-General, or some officer of the Department of Justice designated by him, to prepare and promulgate forms and regulations in conformity to which depositions to be used in relation to claims and accounts against the United States, pending before the head of a Department or Bureau, or before the accounting officers of the Treasury, may be taken.

No. 1.—*Report of suits on Treasury transcripts, other than post-office cases, instituted during the fiscal year ending June 30, 1884, in the several United States courts, and of proceedings had during said period in suits which were instituted prior thereto.*

Judicial districts.	In suits brought during the fiscal year.							In suits brought prior to the fiscal year.					Whole number of judgments for United States during the year.	Whole number of suits disposed of.	Total judgments.	Total collections.
	Number of suits.	Aggregate sued for.	Aggregate in judgment.	Collections.	Decided for the United States.	Settled, dismissed, &c.	Pending.	Judgments in old suits.	Collections in old suits.	Decided for the United States.	Decided against the United States.	Settled, dismissed, &c.				
Alabama, northern district																
Alabama, middle district																
Alabama, southern district																
Arkansas, eastern district									$1,000 00							$1,000 00
Arkansas, western district								$7,051 98	465 16	3			3	3	$7,051 98	465 16
California	6	$49,204 12					6	600 00	2,200 00	1		2	1	3	600 00	2,200 00
Colorado	1	664 16					1		191 53			1		1		191 53
Connecticut									1,000 00							1,000 00
Delaware																
Florida, northern district	1	8,161 79					1	97 62	1,110 62	1	1		1	2	97 62	1,110 62
Florida, southern district																
Georgia, northern district																
Georgia, southern district																
Illinois, northern district	2	24,089 00					2									
Illinois, southern district									1,071 00							1,071 00
Indiana	2	9,732 74		$32 05		1	1		41			1		2		32 46
Iowa, northern district																
Iowa, southern district									401 00			3		3		401 00
Kansas	1	1,128 95					1		4,155 82			1		1		4,155 82
Kentucky	2	7,529 47					2									
Louisiana, eastern district	1	718 66					1		2,335 79							2,335 79
Louisiana, western district																
Maine	2	4,785 10		1,000 00			2									1,000 00
Maryland																
Massachusetts	1	8,161 79	$8,491 21		1				7,280 61			1	1	2	8,491 21	7,280 61
Michigan, eastern district	1	6,959 43					1		320 00							320 00
Michigan, western district																
Minnesota	4	12,648 56					4		10,844 90		1			1		10,844 90
Mississippi, northern district																
Mississippi, southern district	2	4,560 22		887 16		1	1							1		887 16
Missouri, eastern district									58 50							58 50
Missouri, western district	1	6,749 03	10,863 72		1								1	1	10,863 72	

No. 1.—*Report of suits on Treasury transcripts, other than post-office cases, instituted during the fiscal year ending June* 30, 1884, *&c.*—Continued.

Judicial districts.	In suits brought during the fiscal year.							In suits brought prior to the fiscal year.					Whole number of judgments for United States during the year.	Whole number of suits disposed of.	Total judgments.	Total collections.
	Number of suits.	Aggregate sued for.	Aggregate in judgment.	Collections.	Decided for the United States.	Settled, dismissed, &c.	Pending.	Judgments in old suits.	Collections in old suits.	Decided for the United States.	Decided against the United States.	Settled, dismissed, &c.				
Nebraska	3	$14,825 18	$3,508 62		2		1	$6,000 00	$5,495 00	1			3	3	$9,508 62	$5,495 00
Nevada																
New Hampshire																
New Jersey	2	5,217 99	3,164 30		1		1	7,654 91	1,750 00	2			3	3	10,819 21	1,750 00
New York, northern district									1,125 82			3		3		1,125 82
New York, southern district	2	41,149 22					2									
New York, eastern district	1	293 35					1									
North Carolina, eastern district																
North Carolina, western district																
Ohio, northern district								5,502 54		1			1	1	5,502 54	
Ohio, southern district	2	38,979 58					2	17 70	706 54	1		2	1	3	17 70	706 54
Oregon	3	3,289 02					3				1			1		
Pennsylvania, eastern district	1	58 46					1	50,000 00		1			1	1	50,000 00	
Pennsylvania, western district																
Rhode Island																
South Carolina	1	275 95		$275 95		1								1		275 95
Tennessee, eastern district																
Tennessee, middle district																
Tennessee, western district																
Texas, northern district																
Texas, eastern district																
Texas, western district	1	600 34					1									
Vermont																
Virginia, eastern district	3	10,603 01					3		264 70							264 70
Virginia, western district																
West Virginia	1	10,199 48					1									
Wisconsin, eastern district																
Wisconsin, western district												1		1		
Arizona	4	35,661 31					4		1,500 00							1,500 00
Dakota	2	6,893 05					2		52 73			1		1		52 73
Idaho	6	19,729 32					6									
Montana	1	241 65					1									
New Mexico								746 59	307 70	3			3	3	746 59	307 70

Utah	1	2,450 24					1									
Washington	2	2,185 48		206 35		1	1						1			206 35
Wyoming																
District of Columbia	5	11,933 33		220 75		1	4	661 18	3,543 10	1		3	1	5	661 18	3,763 85
Total	68	349,678 98	26,027 85	2,622 26	5	5	58	78,332 52	47,180 93	15	3	19	20	47	104,360 37	49,803 19

No. 2.—*Report of post-office suits instituted during the fiscal year ending June 30, 1884, in the several United States courts, and of proceedings had during said period in suits which were instituted prior thereto.*

Judicial districts.	In suits brought during the fiscal year.							In suits brought prior to the fiscal year.					Whole number of judgments for United States during the year.	Whole number of suits disposed of.	Total judgments.	Total collections.
	Number of suits.	Aggregate sued for.	Aggregate in judgment.	Collections.	Decided for the United States.	Settled, dismissed, &c.	Pending.	Judgments in old suits.	Collections in old suits.	Decided for the United States.	Decided against the United States.	Settled, dismissed, &c.				
Alabama, northern district	3	.....	$1,100 00	$33 30	3	.....	.....	$113 58	$365 00	1	.....	.....	4	4	$1,213 58	$398 30
Alabama, middle district	1	$48 72	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Alabama, southern district	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arkansas, eastern district	.....	.....	.....	.....	.....	.....	.....	580 89	324 22	1	.....	.....	1	1	580 89	324 22
Arkansas, western district	1	1,003 31	.....	.....	.....	.....	1	534 51	66 05	1	1	.....	1	2	534 51	66 05
California	4	.....	590 00	540 00	4	.....	.....	.....	147 00	.....	.....	.....	4	4	590 00	687 00
Colorado	4	15,026 18	2,005 08	.....	3	.....	1	391 38	404 93	2	.....	.....	5	5	2,396 46	404 93
Connecticut	1	.....	50 00	.....	1	.....	.....	.....	.....	.....	.....	.....	1	1	50 00	.....
Delaware	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Florida, northern district	4	.....	400 00	.....	4	.....	.....	1,312 00	.....	1	.....	.....	5	5	1,712 00	.....
Florida, southern district	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Georgia, northern district	2	.....	225 78	71 68	1	1	.....	.....	.....	.....	.....	.....	1	2	225 78	71 68
Georgia, southern district	4	126 92	566 24	189 90	3	1	.....	1,326 40	1,952 05	1	.....	.....	4	5	1,892 64	2,141 95
Illinois, northern district	18	4,321 90	5,447 78	2,537 78	16	1	1	599 45	599 45	4	.....	.....	20	21	6,047 23	3,137 23
Illinois, southern district	7	.....	906 00	806 00	7	.....	.....	.....	.....	.....	.....	.....	7	7	906 00	806 00
Indiana	8	.....	1,920 03	243 51	8	.....	.....	.....	.....	.....	.....	.....	8	8	1,920 03	243 51
Iowa, northern district	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iowa, southern district	4	179 64	507 30	478 09	3	1	.....	.....	.....	.....	.....	.....	3	4	507 30	478 09
Kansas	.....	.....	.....	.....	.....	.....	.....	.....	205 00	.....	.....	.....	.....	.....	.....	205 00
Kentucky	4	.....	971 43	411 43	4	.....	.....	492 15	72 78	1	.....	.....	5	5	1,463 58	484 21
Louisiana, eastern district	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Louisiana, western district	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maine	3	.....	155 00	50 00	3	.....	.....	.....	.....	.....	.....	.....	3	3	155 00	50 00
Maryland	2	.....	591 90	591 90	2	.....	.....	.....	10 00	.....	.....	.....	2	2	591 90	601 90
Massachusetts	3	.....	688 25	663 25	3	.....	.....	.....	.....	.....	.....	.....	3	3	688 25	663 25
Michigan, eastern district	2	.....	116 00	16 00	2	.....	.....	.....	.....	.....	.....	.....	2	2	116 00	16 00
Michigan, western district	4	.....	253 90	153 90	4	.....	..	700 00	.....	1	.....	.....	5	5	953 90	153 90
Minnesota	3	.....	110 00	100 00	3	.....	.....	171 70	.....	1	.....	.....	4	4	281 70	100 00
Mississippi, northern district	2	90 81	54 50	54 50	1	.....	1	.....	.....	.....	.....	.....	1	1	54 50	54 50
Mississippi, southern district	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Missouri, eastern district	6	.....	1,160 00	.....	6	.....	.....	.....	96 96	.....	.....	.....	6	6	1,160 00	96 96
Missouri, western district	7	275 84	1,013 87	666 45	6	1	.....	1,366 58	76 15	2	.....	.....	8	9	2,380 45	742 60

Nebraska	3		478 20	50 00	3			105 00		1			4	4	583 20	50 00
Nevada								657 42	107 02	1			1	1	657 42	107 02
New Hampshire																
New Jersey	3		1,350 00	1,100 00	3				3,324 53				3	3	1,350 00	4,424 53
New York, northern district	10		2,280 00	980 00	10								10	10	2,280 00	980 00
New York, southern district	154	8,416 51	1,322 58	3,637 58	10	89	55	100 00	150 00	1			11	100	1,422 58	3,787 58
New York, eastern district	2	150 25	85 19		1		1						1	1	85 19	
North Carolina, eastern district	1	766 88					1									
North Carolina, western district								578 12	578 12	1	1		1	2	578 12	578 12
Ohio, northern district	17		1,127 25	1,040 25	17								17	17	1,127 25	1,040 25
Ohio, southern district	13		763 36	500 05	13				93 78				13	13	763 36	593 83
Oregon	1		25 00		1								1	1	25 00	
Pennsylvania, eastern district	5		245 00		5			100 00	928 35	1	1		6	7	345 00	928 35
Pennsylvania, western district	14	116 02	2,046 57	841 67	13	1							13	14	2,046 57	841 67
Rhode Island																
South Carolina	1		100 00		1								1	1	100 00	
Tennessee, eastern district	2		282 40		2								2	2	282 40	
Tennessee, middle district	2	106 58	219 03		2								2	2	219 03	
Tennessee, western district	4		494 52	444 40	4			814 05		2			6	6	1,308 57	444 40
Texas, northern district	1	221 00					1									
Texas, eastern district	1		250 00		1								1	1	250 00	
Texas, western district	2	2,535 62					2	25 00		1			1	1	25 00	
Vermont	1		117 00	117 00	1								1	1	117 00	117 00
Virginia, eastern district																
Virginia, western district								5 00		1			1	1	5 00	
West Virginia	3		947 47		3			4,878 14		7			10	10	5,825 61	
Wisconsin, eastern district	4		382 75	182 75	4			5,143 59		2			6	6	5,526 34	182 75
Wisconsin, western district	4		276 28	276 28	3	1							3	4	276 28	276 28
Arizona	3		300 00		3				1,600 00			1	3	4	300 00	1,600 00
Dakota	1		500 00		1								1	1	500 00	
Idaho																
Montana																
New Mexico	2	2,263 11					2									
Utah	3	1,463 56		111 53		1	2							1		111 53
Washington	1		118 25	118 25	1								1	1	118 25	118 25
Wyoming																
District of Columbia																
Total	355	37,112 85	32,543 91	17,007 45	189	97	69	19,994 96	11,101 39	34	3	1	223	324	52,538 87	28,108 84

No. 3.—*Report of suits on custom-house bonds instituted during the fiscal year ending June* 30, 1884, *in the several United States courts, and of proceedings had during said period in suits which were instituted prior thereto.*

Judicial districts.	In suits brought during the fiscal year.							In suits brought prior to the fiscal year.					Whole number of suits disposed of.	Whole number of judgments for United States during the year.	Total judgments.	Total collections.
	Number of suits.	Aggregate sued for.	Aggregate in judgment.	Collections.	Decided for the United States.	Settled, dismissed, &c.	Pending.	Judgments in old suits.	Decided for the United States.	Decided against the United States.	Settled, dismissed, &c.	Collections in old suits.				
California	5	$8,000 00	.....	.....	.....	3	2	.....	.....	.....	.....	.....	3	.....	.....	.....
Florida, southern district	3	141 74	$125 80	$119 02	3	.....	.....	.....	.....	.....	.....	$706 18	3	3	$125 80	$825 20
Illinois, northern district	2	114 45	63 25	169 25	1	1	.....	.....	.....	.....	.....	170 07	2	1	63 25	339 32
Louisiana, eastern district	.....	.....	.....	.....	.....	.....	.....	$1,255 00	1	1	.....	.....	2	1	1,255 00	.....
Massachusetts	4	1,394 70	.....	83 62	.....	1	3	.....	.....	.....	1	88 96	2	.....	.....	172 58
Minnesota	10	41,650 00	.....	.....	.....	.....	10	.....	.....	.....	.....	.....	.....	.....	.....	.....
New York, southern district	3	1,774 50	.....	.....	.....	.....	3	188 13	2	.....	.....	358 91	2	2	188 13	358 91
Total	27	53,075 39	189 05	371 89	4	5	18	1,443 13	3	1	1	1,324 12	14	7	1,632 18	1,696 01

No. 4.—*Report of suits for fines, penalties, and forfeitures under the customs-revenue laws, &c., instituted during the fiscal year ending June 30, 1884, in the several United States courts, and of proceedings had during said period in suits which were instituted prior thereto.*

Judicial districts.	In suits brought during the fiscal year.									In suits brought prior to the fiscal year.						Whole number of judgments in favor of the United States.	Whole number of suits disposed of.	Total judgments.	Total collections.
	Number of suits.	Aggregate sued for.	Aggregate in judgment.	Collections.	Decided for the United States.	Decided against the United States.	Settled, dismissed, &c.	Remitted.	Pending.	Judgments in old suits.	Collections in old suits.	Decided for the United States.	Decided against the United States.	Settled, dismissed, &c.	Remitted.				
Alabama, northern district	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Alabama, middle district	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Alabama, southern district	1	...	...	$326 00	1	...	...	...	...	...	...	...	...	...	...	1	1	...	$326 00
Arkansas, eastern district	1	$500 00	...	44 00	...	...	...	1	...	...	...	...	...	...	...	...	1	...	44 00
Arkansas, western district	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
California	19	65 00	$550 00	3,990 10	15	...	1	...	3	$8,179 00	$360 21	6	1	...	...	21	23	$8,729 00	4,350 31
Colorado	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Connecticut	...	...	...	...	...	...	...	...	...	50 00	200 00	1	...	1	...	1	2	50 00	200 00
Delaware	1	500 00	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...
Florida, northern district	4	7,900 00	...	295 14	...	...	3	...	1	...	...	...	...	...	...	...	3	...	295 14
Florida, southern district	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Georgia, northern district	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Georgia, southern district	2	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	2	...	...
Illinois, northern district	1	...	...	...	...	...	...	...	1	...	1,000 00	...	1	...	...	...	1	...	1,000 00
Illinois, southern district	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Indiana	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Iowa, northern district	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Iowa, southern district	1	500 00	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Kansas	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kentucky	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Louisiana, eastern district	14	3,500 00	600 00	20 00	2	...	3	4	5	...	79 80	...	2	5	...	2	16	600 00	99 80
Louisiana, western district	5	200 00	...	...	...	...	3	...	2	500 00	...	1	...	...	...	1	4	500 00	...
Maine	16	3,482 20	231 00	2,429 90	6	...	2	2	6	1,713 00	3,092 44	5	1	...	...	11	16	1,944 00	5,522 34
Maryland	5	240 00	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...
Massachusetts	11	5,300 00	...	89 94	...	...	4	...	7	...	...	...	...	...	...	...	4	...	89 94
Michigan, eastern district	5	334 50	200 00	175 00	4	...	...	...	1	...	...	1	...	...	...	5	5	200 00	175 00
Michigan, western district	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Minnesota	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mississippi, northern district	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mississippi, southern district	9	1,950 00	50 00	161 50	2	1	...	3	3	...	...	...	...	1	...	2	7	50 00	161 50
Missouri, eastern district	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Missouri, western district	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nebraska	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

No. 4.—*Report of suits for fines, penalties, and forfeitures under the customs-revenue laws, &c., instituted during the fiscal year, &c.*—Continued.

Judicial districts.	In suits brought during the fiscal year.									In suits brought prior to the fiscal year.						Whole number of judgments in favor of the United States.	Whole number of suits disposed of.	Total judgments.	Total collections.
	Number of suits.	Aggregate sued for.	Aggregate in judgment.	Collections.	Decided for the United States.	Decided against the United States.	Settled, dismissed, &c.	Remitted.	Pending.	Judgements in old suits.	Collections in old suits.	Decided for the United States.	Decided against the United States.	Settled, dismissed, &c.	Remitted.				
Nevada	....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	....	.....	....	.....	.....
New Hampshire	....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	....	.....	....	.....	.....
New Jersey	13	.....	$1,260 00	$1,025 00	11	.....	.....	....	2	$100 00	$100 00	1	.....	.....	1	12	13	$1,360 00	$1,125 00
New York, northern district	9	.....	535 00	1,036 22	9	.....	.....	....	....	50 00	50 00	1	.....	.....	....	10	10	585 00	1,086 22
New York, southern district	28	$33,674 57	545 00	8,432 23	18	.....	3	1	6	400 00	12,110 98	3	2	5	....	21	32	945 00	20,543 21
New York, eastern district	16	.....	976 00	41 00	16	.....	.....	....	....	.....	.....	.....	.....	.....	....	16	16	976 00	41 00
North Carolina, eastern district	....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	....	.....	..	.....	.....
North Carolina, western district	....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	....	.....	....	.....	.....
Ohio, northern district	1	100 00	.....	.....	.....	1	.....	....	....	.....	63 00	.....	.....	.....	....	.....	1	.....	63 00
Ohio, southern district	1	500 00	.....	.....	.....	.....	.....	....	1	.....	39 61	.....	.....	2	....	.....	2	.....	39 61
Oregon	....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	....	.....	....	.....	.....
Pennsylvania, eastern district	3	1,900 00	.....	.....	.....	2	.....	....	1	.....	.....	.....	.....	5	....	.....	....	.....	.....
Pennsylvania, western district	1	500 00	.....	.....	.....	.....	.....	1	....	.....	.....	.....	.....	.....	....	.....	7	.....	.....
Rhode Island	....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	....	.....	1	.....	.....
South Carolina	....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	....	.....	....	.....	.....
Tennessee, eastern district	....	.....	.....	.....	.....	.....	.....	....	....	.....	79 45	.....	.....	2	....	.....	....	.....	79 45
Tennessee, middle district	....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	....	.....	2	.....	.....
Tennessee, western district	....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	....	.....	....	.....	.....
Texas, northern district	....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	....	.....	....	.....	.....
Texas, eastern district	1	900 00	62 10	62 10	1	.....	.....	....	....	.....	.....	.....	.....	.....	...	1	1	62 10	62 10
Texas, western district	29	.....	1,833 00	296 10	29	.....	.....	....	....	131 00	1,058	3	.....	.....	....	32	32	1,964 00	1,354 10
Vermont	6	.....	1,960 00	.....	6	.....	.....	....	....	.....	.....	.....	.....	.....	....	6	6	1,960 00	.....
Virginia, eastern district	....	.....	.....	.....	.....	.....	.....	....	....	.....	61 00	1	.....	3	....	1	4	.....	61 00
Virginia, western district	....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	....	.....	....	.....	.....
West Virginia	....	.....	.....	.....	.....	.....	.....	....	....	205 00	.....	3	.....	.....	....	3	3	205 00	.....
Wisconsin, eastern district	....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	....	.....	....	.....	.....
Wisconsin, western district	....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	...	.....	....	.....	.....
Arizona	....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	....	.....	....	.....	.....
Dakota	....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	....	.....	....	.....	.....
Idaho	....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	....	.....	....	.....	.....

Montana																			
New Mexico	1																		
Utah									1										
Washington	1		50 00	50 00	1						537 18								
Wyoming																1	1	50 00	587 18
District of Columbia																			
Total	206	62,046 27	8,852 10	18,474 23	121	6	20	12	47	11,328 00	18,831 67	26	7	24	1	147	217	20,180 10	37,305 90

No. 5.—*Report of suits against collectors of customs and other officers, instituted during the fiscal year ending June 30, 1884, in the several United States courts, and of proceedings had during said period in suits which were instituted prior thereto.*

Judicial districts.	In suits brought during the fiscal year.					In suits brought prior to the fiscal year.			Whole number of suits disposed of.	Whole number of judgments in favor of United States during the year.
	Number of suits.	Decided for the United States.	Decided against the United States.	Settled, dismissed, &c.	Pending.	Decided for the United States.	Decided against the United States.	Settled, dismissed, &c.		
California	25	.....	2	.....	23	1	2	.....	5	1
Illinois, northern district	41	2	3	.....	36	13	11	.....	29	15
Louisiana, eastern district	1	.....	.....	.....	1	.....	.....	.....	.....	.....
Maine	.....	.....	.....	.....	.....	.....	1	.....	1	.....
Maryland	9	.....	.....	.....	9	.....	.....	.....	.....	.....
Massachusetts	45	.....	.....	2	43	1	1	8	12	1
New York, northern district	2	.....	.....	1	1	.....	2	5	8	.....
New York, southern district	565	.....	.....	84	481	4	31	570	689	4
New York, eastern district	28	.....	.....	.....	28	5	.....	.....	5	5
Ohio, southern district	9	.....	.....	.....	9	.....	1	.....	1	.....
Pennsylvania, eastern district	82	.....	3	4	75	.....	3	23	33	.....
Texas, eastern district	3	.....	.....	.....	3	.....	.....	.....	.....	.....
Vermont	1	.....	.....	.....	1	.....	.....	.....	.....	.....
Total	811	2	8	91	710	24	52	606	783	26

No. 6.—Report of miscellaneous suits instituted during the fiscal year ending June 30, 1884, in the several United States courts, and of proceedings had during said period in suits which were instituted prior thereto.

Judicial districts.	In suits brought during the fiscal year.								In suits brought prior to the fiscal year.							
	Number of suits.	Aggregate sued for.	Aggregate in judgment.	Collections.	Decided for the United States.	Decided against the United States.	Settled, dismissed, &c.	Pending.	Judgments in old suits.	Collections in old suits.	Decided for the United States.	Decided against the United States.	Settled, dismissed, &c	Whole number of judgments for United States during the year.	Whole number of suits disposed of.	Total judgments.	Total collections.
Alabama, northern district	48	$11,150 00	$2,407 00	.....	13	....	1	34	$1,856 00	.....	19	...	20	32	53	$4,263 00	.....
Alabama, middle district	43	1,600 00	555 35	.....	14	....	19	10	207 00	$60 00	9	...	....	23	42	762 35	$60 00
Alabama, southern district	130	10,050 00	1,964 45	$150 72	53	....	52	25	1,651 73	361 20	4	....	12	57	121	3,616 18	511 92
Arkansas, eastern district	16	7,377 26	5,630 50	361 00	10	1	5		2,006 06	1,012 78	6	...	2	16	24	7,636 56	1,373 78
Arkansas, western district	239	32,813 80	11,362 17	1,551 31	218	1	2	18	28,606 00	1,054 93	9	1	6	227	237	39,968 17	2,606 24
California	36	117,753 59	1,382 50	4,389 34	22	....	1	13	36,560 87	32,912 34	2	..	...	24	25	37,943 37	37,301 68
Colorado	7	500 00	1,202 12	610 59	5	....	1	1	50 00	2,607 39	1	1	5	6	13	1,252 12	3,217 98
Connecticut	6	600 00	962 00	796 84	5	....	1	....	.....	.....	..	..	....	5	6	962 00	796 84
Delaware	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	...	.....	.....	.....	.....	.....
Florida, northern district	7	3,617 00	1,677 00	811 50	6	....	1	....	2,400 20	3,490 57	2	....	3	8	12	4,077 20	4,302 07
Florida, southern district	3	500 00	50 00	69 70	1	....	..	2	.....	.....	..	....	....	1	1	50 00	69 70
Georgia, northern district	61	23,300 00	1,200 00	61 10	4	....	35	22	4,750 00	247 62	17	....	39	21	95	5,950 00	308 72
Georgia, southern district	9	.....	751 00	482 75	5	....	4	..	.....	.....	..	1	....	5	10	751 00	482 75
Illinois, northern district	9	1,158 00	7 00	.....	7	....	....	2	1,002 00	.....	3	2	....	10	12	1,009 00	.....
Illinois, southern district	35	4,098 44	2,611 00	3,185 57	27	..	....	8	100 00	527 20	3	....	....	30	30	2,711 00	3 712 77
Indiana	31	73 62	964 00	371 06	30	..	..	1	510 00	789 31	3	....	....	33	33	1,474 00	1,160 37
Iowa, northern district	3	34 79	176 00	.....	2	....	..	1	2 00	.....	2	....	....	4	4	178 00	.....
Iowa, southern district	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kansas	7	.....	73 00	.....	5	....	....	2	1 00	26,429 10	1	....	2	6	8	74 00	26,429 10
Kentucky	45	14,814 00	3,660 00	102 28	23	....	....	22	960 00	456 50	4	....	2	27	29	4,620 00	558 78
Louisiana, eastern district	28	339,723 54	1,015 00	.....	1	....	1	26	160 50	219 10	3	....	....	4	5	1,175 50	219 10
Louisiana, western district	4	.....	1,450 00	.....	4	....	....	....	.....	.....	....	....	....	4	4	1,450 00	.....
Maine	7	.....	1,490 00	544 80	7	....	....	....	325 00	1,213 28	8	....	....	15	15	1,815 00	1,758 08
Maryland	8	1,672 02	300 00	.....	3	....	....	5	.....	.....	....	...	2	3	5	300 00	.....
Massachusetts	30	3,971 30	1,535 00	1,195 50	24	....	1	5	1,315 46	2,227 85	15	1	3	39	44	2,850 46	3,423 35
Michigan, eastern district	13	214 25	1,770 00	821 50	12	....	....	1	.....	791 03	....	....	....	12	12	1,770 00	1,612 53
Michigan, western district	19	7,878 97	2,870 25	1,250 13	14	....	....	5	1,613 00	1,125 33	5	....	1	19	20	4,483 25	2,375 46
Minnesota	48	52,065 84	3,368 17	1,940 99	33	1	4	10	5,584 99	2,899 66	8	1	5	41	52	8,953 16	4,840 65
Mississippi, northern district	.....	.....	.....	.....	.....	.....	.....	.....	105 00	50 00	11	....	1	11	12	105 00	50 00
Mississippi, southern district	.....	.....	.....	.....	.....	.....	.....	.....	901 08	1,332 46	9	....	4	9	13	901 08	1,332 46
Missouri, eastern district	19	5,750 00	545 00	.....	13	....	...	6	12,093 96	.....	1	....	....	14	14	12,638 96	.....
Missouri, western district	56	16,335 00	6,750 89	316 80	42	....	7	7	5,219 10	641 40	16	1	1	58	67	11,969 99	958 20
Nebraska	24	.....	24 00	.....	21	....	....	....	15 00	559 22	1	....	....	25	25	39 00	559 22

No. 6.—*Report of miscellaneous suits instituted during the fiscal year ending June* 30, 1884, *&c.*—Continued.

Judicial districts.	In suits brought during the fiscal year.								In suits brought prior to the fiscal year.					Whole number of judgments for United States during the year.	Whole number of suits disposed of.	Total judgments.	Total collections.
	Number of suits.	Aggregate sued for.	Aggregate in judgment.	Collections.	Decided for the United States.	Decided against the United States.	Settled, dismissed, &c.	Pending.	Judgments in old suits.	Collections in old suits.	Decided for the United States.	Decided against the United States.	Settled, dismissed, &c.				
Nevada	1		$500 00		1									1	1	$500 00	
New Hampshire																	
New Jersey	3	$800 00	550 00		2			1					3	2	5	550 00	
New York, northern district	21	250 00	950 00	$565 00	20		1		$50 00	$50 00	1			21	22	1,000 00	$615 00
New York, southern district	66	37,840 87	10,459 63	9,256 56	16		23	27	11 00	2,989 03	2	2	2	18	45	10,470 63	12,245 59
New York, eastern district	10	50 94	89 00	39 32	8		1	1					1	8	10	89 00	39 32
North Carolina, eastern district	3	160 00	80 00		1		1	1	5,276 00	337 65	59		4	60	65	5,356 00	337 65
North Carolina, western district	97	23,540 00	6,780 00	6 86	29		21	47	4,650 00	491 96	18		17	47	85	11,430 00	498 82
Ohio, northern district	5	276 86	290 00	241 25	4			1		459 32			1	4	5	290 00	700 57
Ohio, southern district	17	2,619 10	2,696 30	2,721 64	9		7	1		230 06			8	9	24	2,696 30	2,951 70
Oregon	103	52,294 66	3,108 09	2,295 04	99		1	3	1,100 00	200 00	2		1	101	103	4,208 09	2,495 04
Pennsylvania, eastern district	39	10,128 65	5,168 50	1,089 39	31	2	1	5	15,800 00	60 84	3	4	2	34	43	20,968 50	1,150 23
Pennsylvania, western district	39	67,700 00	3,797 00	1,570 28	26	6	1	6		661 27	1			27	34	3,797 00	2,231 55
Rhode Island	1		25 00		1									1	1	25 00	
South Carolina	4		400 00		4				300 00		2			6	6	700 00	
Tennessee, eastern district	24	15,800 00	925 00		6		9	9	6,612 18	288 89	8		12	14	35	7,537 18	288 89
Tennessee, middle district	25	10,200 00	656 82		11		4	10	4,657 37	91,414 13	14	1		25	30	5,314 19	91,414 13
Tennessee, western district	19	3,525 00	1,350 00	257 64	13		3	3	275 00	315 11	2			15	18	1,625 00	572 75
Texas, northern district	25	4,459 06	466 00	298 64	10		6	9	1,950 00	48 63	5		4	15	25	2,416 00	347 27
Texas, eastern district	8	1,104 26	201 00		2	1		5	800 00	76 00	4		1	6	8	1,001 00	76 00
Texas, western district	4	13,316 25	300 00	300 00	1			3	21,101 61	182 90	6		4	7	11	21,401 61	482 90
Vermont	2		2 00		2					3,100 00			1	2	3	2 00	3,100 00
Virginia, eastern district	4	140 00	140 00	140 00	3		1			73 05			3	3	7	140 00	213 05
Virginia, western district	19	1,950 00	200 00		1		1	17	1,200 00		11		13	12	26	1,400 00	
West Virginia	3		450 00	12 65	3				568 50	868 45	3		1	6	7	1,018 50	881 10
Wisconsin, eastern district	19	11,699 65	35 00	232 67	12		1	6	250 00	356 10	1		2	13	16	285 00	588 77
Wisconsin, western district	18	1,500 00	2,632 70	675 00	16			2	2,012 95	1,691 51	7			23	23	4,645 65	2,366 51
Arizona	4	2,447 19	1,900 00	1,875 00	3			1		824 27				3	3	1,900 00	2,699 27
Dakota	140	114,092 70	4,681 00	3,201 00	25		1	114						25	26	4,681 00	3,201 00
Idaho	3	6,443 86	24 00	24 00	1	1		1						1	2	24 00	24 00
Montana	1	12,000 00				1				511 84					1		511 84

New Mexico	4	17,000 00	755 70		3		1	1,090 40	902 40	5	1	8	9	1,846 10	902 40	
Utah																
Washington	24	995 00	3,087 72	1,264 76	24				2,222 72	2		26	26	3,087 72	3,487 48	
Wyoming	3	83,004 90				1	2						1			
District of Columbia								25,959 97	4,848 71	2	1	2	3	25,959 97	4,848 71	
Total	1,749	1,152,390 37	110,453 86	45,080 18	1,014	15 218	502	201,660 93	194,213 11	320	15 190	1,334	1,772	312,114 79	239,293 29	

No. 7.—*Statistical summary of business arising from suits, &c., in which the United States is a party or has an interest, under charge of the Solicitor of the Treasury, during the fiscal year ending June 30, 1884.*

Judicial districts.	In suits brought during the fiscal year ending June 30, 1884.										
	Suits on Treasury transcripts.		Post-office suits.		Suits on custom-house bonds.		Suits for fines, penalties and forfeitures under the customs-revenue laws.		Suits against collectors of customs, &c.	Miscellaneous suits.	
	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	No.	Amount.
Alabama, northern district			3							48	$11,150 00
Alabama, middle district			1	$48 72						43	1,600 00
Alabama, southern district							1			130	10,050 00
Arkansas, eastern district							1	$500 00		16	7,377 26
Arkansas, western district			1	1,003 31						239	32,813 80
California	6	$49,204 12	4		5	$8,000 00	19	65 00	25	36	117,753 59
Colorado	1	664 16	4	15,026 18						7	500 00
Connecticut			1							6	600 00
Delaware							1	500 00			
Florida, northern district	1	8,161 79	4				4	7,900 00		7	3,617 00
Florida, southern district					3	141 74	1			3	5 0 00
Georgia, northern district			2							61	23,300 00
Georgia, southern district			4	126 92			2			9	
Illinois, northern district	2	24,089 00	18	4,321 90	2	114 45	1		41	9	1,158 00
Illinois, southern district			7							35	4,098 44
Indiana	2	9,732 74	8							31	73 62
Iowa, northern district										3	34 79
Iowa, southern district			4	179 64			1	500 00			
Kansas	1	1,128 95								7	
Kentucky	2	7,529 47	4							45	14,814 00
Louisiana, eastern district	1	718 66					14	3,500 00	1	28	339,723 54
Louisiana, western district							5	200 00		4	
Maine	2	4,785 10	3				16	3,482 20		7	
Maryland			2				5	240 00	9	8	1,672 02
Massachusetts	1	8,161 79	3		4	1,394 70	11	5,200 00	45	30	3,971 30
Michigan, eastern district	1	6,959 43	2				5	334 50		13	214 25
Michigan, western district			4							19	7,878 97
Minnesota	4	12,648 56	3		10	41,650 00				48	52,065 84

Mississippi, northern district			2	90 81							
Mississippi, southern district	2	4,560 22					9	1,950 00			
Missouri, eastern district			6							19	5,750 00
Missouri, western district	1	6,749 03	7	275 84						56	16,335 00
Nebraska	3	14,825 18	3							24	
Nevada										1	
New Hampshire											
New Jersey	2	5,217 99	3				13			3	800 00
New York, northern district			10				9		2	21	250 00
New York, southern district	2	41,149 22	154	8,416 51	3	1,774 50	28	33,674 57	565	66	37,840 87
New York, eastern district	1	293 35	2	150 25			16		28	10	50 94
North Carolina, eastern district			1	766 88						3	160 00
North Carolina, western district										97	23,540 00
Ohio, northern district			17				1	100 00		5	276 86
Ohio, southern district	2	38,979 58	13				1	500 00	9	17	2,619 10
Oregon	3	3,289 02	1							103	52,294 66
Pennsylvania, eastern district	1	58 46	5				3	1,900 00	82	39	10,128 65
Pennsylvania, western district			14	116 02			1	500 00		39	67,700 00
Rhode Island										1	
South Carolina	1	275 95	1							4	
Tennessee, eastern district			2							24	15,800 00
Tennessee, middle district			2	106 58						25	10,200 00
Tennessee, western district			4							19	3,525 00
Texas, northern district			1	221 00						25	4,459 06
Texas, eastern district			1				1	900 00	3	8	1,104 26
Texas, western district	1	600 34	2	2,535 62			29			4	13,316 25
Vermont			1				6		1	2	
Virginia, eastern district	3	10,603 01								4	140 00
Virginia, western district										19	1,950 00
West Virginia	1	10,199 48	3							3	
Wisconsin, eastern district			4							19	11,699 65
Wisconsin, western district			4							18	1,500 00
Arizona	4	35,661 31	3							4	2,447 19
Dakota	2	6,893 05	1							140	114,092 70
Idaho	6	19,729 32								3	6,443 86
Montana	1	241 65								1	12,000 00
New Mexico			2	2,263 11			1			4	17,000 00
Utah	1	2,450 24	3	1,463 56							
Washington	2	2,185 48	1				1			24	995 00
Wyoming										3	83,004 90
District of Columbia	5	11,933 33									
Total	68	349,678 98	355	37,112 85	27	53,075 39	206	62,046 27	811	1,749	1,152,390 37

No. 7.—*Statistical summary of business arising from suits, &c., in which the United States is a party or has an interest, &c.*—Continued.

Judicial districts.	In suits brought during the fiscal year—Continued.								
	Total amount reported sued for.	Total amount reported in judgment in favor of the United States.	Total amount reported collected.	Decided for the United States.	Decided against the United States.	Settled, dismissed, &c.	Remitted.	Pending.	Total number of suits commenced.
Alabama, northern district	$11,150 00	$3,507 00	$33 30	16	.....	1	.....	34	51
Alabama, middle district	1,648 72	555 35	.....	14	.....	19	.....	11	44
Alabama, southern district	10,050 00	1,964 45	476 72	54	.....	52	.....	25	131
Arkansas, eastern district	7,877 26	5,630 50	405 00	10	1	5	1	.....	17
Arkansas, western district	33,817 11	11,362 17	1,551 31	218	1	2	.....	19	240
California	175,022 71	2,522 50	8,919 44	41	2	5	.....	47	95
Colorado	16,190 34	3,207 20	610 59	8	.....	1	.....	3	12
Connecticut	600 00	1,012 00	796 84	6	.....	1	.....	.....	7
Delaware	500 00	.....	.....	.....	.....	1	.....	.....	1
Florida, northern district	19,678 79	2,077 00	1,106 64	10	.....	4	.....	2	16
Florida, southern district	641 74	175 80	188 72	4	.....	.....	.....	3	7
Georgia, northern district	23,300 00	1,425 78	132 78	5	.....	36	.....	22	63
Georgia, southern district	126 92	1,317 24	672 65	8	2	5	.....	.....	15
Illinois, northern district	29,683 35	5,518 03	2,707 03	26	3	2	.....	42	73
Illinois, southern district	4,098 44	3,517 00	3,991 57	34	.....	.....	.....	8	42
Indiana	9,806 36	2,884 03	646 62	38	.....	1	.....	2	41
Iowa, northern district	34 79	176 00	.....	2	.....	.....	.....	1	3
Iowa, southern district	679 64	507 30	478 09	3	.....	1	.....	1	5
Kansas	1,128 95	73 00	.....	5	.....	.....	.....	3	8
Kentucky	22,343 47	4,631 43	513 71	27	.....	.....	.....	24	51
Louisiana, eastern district	343,942 20	1,615 00	20 00	3	.....	4	4	33	44
Louisiana, western district	200 00	1,450 00	.....	4	.....	3	.....	2	9
Maine	8,267 30	1,876 00	4,024 70	16	.....	2	2	8	28
Maryland	1,912 02	891 90	591 90	5	.....	.....	.....	19	24
Massachusetts	18,827 79	10,714 46	2,032 31	28	.....	8	.....	58	94
Michigan, eastern district	7,508 18	2,086 00	1,012 50	18	.....	.....	.....	3	21
Michigan, western district	7,878 97	3,124 15	1,404 03	18	.....	.....	.....	5	23
Minnesota	106,364 40	3,478 17	2,040 99	36	1	4	.....	24	65
Mississippi, northern district	90 81	54 50	54 50	1	.....	.....	.....	1	2
Mississippi, southern district	6,510 22	50 00	1,048 66	2	1	1	3	4	11
Missouri, eastern district	5,750 00	1,705 00	.....	19	.....	.....	.....	6	25
Missouri, western district	23,359 87	18,628 48	983 25	49	.....	8	.....	7	64
Nebraska	14,825 18	4,010 82	50 00	29	.....	.....	.....	1	30

Nevada		500 00		1					1
New Hampshire									
New Jersey	6,017 99	6,324 30	2,125 00	17				4	21
New York, northern district	250 00	3,765 00	2,581 22	39		2		1	42
New York, southern district	122,855 67	12,327 21	21,326 37	44		199	1	574	818
New York, eastern district	494 54	1,150 19	80 32	25		1		31	57
North Carolina, eastern district	926 88	80 00		1		1		2	4
North Carolina, western district	23,540 00	6,780 00	6 86	29		21		47	97
Ohio, northern district	376 86	1,417 25	1,281 50	21	1			1	23
Ohio, southern district	42,098 68	3,459 66	3,221 69	22		7		13	42
Oregon	55,583 68	3,133 09	2,295 04	100		1		6	107
Pennsylvania, eastern district	12,087 11	5,413 50	1,089 39	36	7	5		82	130
Pennsylvania, western district	68,316 02	5,843 57	2,411 95	39	6	2	1	6	54
Rhode Island		25 00		1					1
South Carolina	275 95	500 00	275 95	5		1			6
Tennessee, eastern district	15,800 00	1,207 40		8		9		9	26
Tennessee, middle district	10,306 58	875 85		13		4		10	27
Tennessee, western district	3,525 00	1,844 52	702 04	17		3		3	23
Texas, northern district	4,680 06	466 00	298 64	10		6		10	26
Texas, eastern district	2,004 26	513 10	62 10	4	1			8	13
Texas, western district	16,452 21	2,133 00	596 10	30				6	36
Vermont		2,079 00	117 00	9				1	10
Virginia, eastern district	10,743 01	140 00	140 00	3		1		3	7
Virginia, western district	1,950 00	200 00		1		1		17	19
West Virginia	10,199 48	1,397 47	12 65	6				1	7
Wisconsin, eastern district	11,699 65	417 75	415 42	16		1		6	23
Wisconsin, western district	1,500 00	2,908 98	951 28	19		1		2	22
Arizona	38,108 50	2,200 00	1,875 00	6				5	11
Dakota	120,985 75	5,181 00	3,201 00	26		1		116	143
Idaho	26,173 18	24 00	24 00	1	1			7	9
Montana	12,241 65				1			1	2
New Mexico	19,263 11	755 70		3				4	7
Utah	3,913 80		111 53			1		3	4
Washington	3,180 48	3,255 97	1,639 36	26		1		1	28
Wyoming	83,004 90				1			2	3
District of Columbia	11,933 33		220 75			1		4	5
Total	1,654,303 86	178,066 77	83,556 01	1,335	29	436	12	1,404	3,216

No. 7.—*Statistical summary of business arising from suits, &c., in which the United States is a party or has an interest, &c.*—Continued.

Judicial districts.	In suits brought prior thereto.						Total number of judgments rendered in favor of the United States this year.	Total number of suits disposed of.	Whole amount of judgments rendered in favor of the United States during the fiscal year ending June 30, 1884.	Total amount of collections from all sources during the fiscal year ending June 30, 1884.
	Amount of judgments reported in all old suits this year.	Amount reported collected in all old suits this year.	Decided for the United States.	Decided against the United States.	Settled, dismissed, &c.	Remitted.				
Alabama, northern district	$1,969 58	$365 00	20	.....	20	.....	36	57	$5,476 58	$398 30
Alabama, middle district	207 00	60 00	9	.....	.....	.....	23	42	762 35	60 00
Alabama, southern district	1,651 73	1,361 20	4	.....	12	.....	58	122	3,616 18	1,837 92
Arkansas, eastern district	9,638 93	1,802 16	10	.....	2	.....	20	29	15,269 43	2,207 16
Arkansas, western district	29,140 51	1,120 98	10	2	6	.....	228	239	40,502 68	2,672 29
California	45,339 87	35,619 55	10	3	2	.....	51	63	47,862 37	44,538 99
Colorado	441 38	3,203 85	3	1	6	.....	11	19	3,648 58	3,814 44
Connecticut	50 00	1,200 00	1	.....	1	.....	7	9	1,062 00	1,996 84
Delaware	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Florida, northern district	3,809 82	4,601 19	4	1	3	.....	14	22	5,886 82	5,707 83
Florida, southern district	.....	706 18	.....	.....	.....	.....	4	4	175 80	894 90
Georgia, northern district	4,750 00	247 62	17	.....	39	.....	22	97	6,175 78	380 40
Georgia, southern district	1,326 40	1,952 05	1	1	.....	.....	9	17	2,643 64	2,624 70
Illinois, northern district	1,601 45	1,769 52	20	14	.....	.....	46	65	7,119 48	4,476 55
Illinois, southern district	100 00	1,598 20	3	.....	.....	.....	37	37	3,617 00	5,589 77
Indiana	510 00	789 72	3	.....	1	.....	41	43	3,394 03	1,436 34
Iowa, northern district	2 00	.....	2	.....	.....	.....	4	4	178 00	.....
Iowa, southern district	.....	401 00	.....	.....	3	.....	3	7	507 30	879 09
Kansas	1 00	30,789 92	1	.....	3	.....	6	9	74 00	30,789 92
Kentucky	1,452 15	529 28	5	.....	2	.....	32	34	6,083 58	1,042 99
Louisiana, eastern district	1,415 50	2,634 69	4	3	5	.....	7	23	3,030 50	2,654 69
Louisiana, western district	500 00	.....	1	.....	.....	.....	5	8	1,950 00	.....
Maine	2,038 00	4,305 72	13	2	.....	.....	29	35	3,914 00	8,330 42
Maryland	.....	10 00	.....	.....	2	.....	5	7	891 90	601 90
Massachusetts	1,315 46	9,597 42	16	2	13	.....	44	67	12,029 92	11,629 73
Michiga , eastern district	.....	1,111 03	1	.....	.....	.....	19	19	2,086 00	2,123 53
Michigan, western district	2,313 00	1,125 33	6	.....	1	.....	24	25	5,437 15	2,529 36
Minnesota	5,756 69	13,744 56	9	2	5	.....	45	57	9,234 86	15,785 55
Mississippi, northern district	105 00	50 00	11	.....	1	.....	12	13	159 50	104 50
Mississippi, southern district	901 08	1,332 46	9	.....	5	.....	11	21	951 08	2,381 12
Missouri, eastern district	12,093 96	155 46	1	.....	.....	.....	20	20	13,798 96	155 46
Missouri, western district	6,585 68	717 55	18	1	1	.....	67	77	25,214 16	1,700 80

Nebraska	6,120 00	6,054 22	3				32	32	10,130 82	6,104 22
Nevada	657 42	107 02	1				2	2	1,157 42	107 02
New Hampshire										
New Jersey	7,754 91	5,174 53	3		3	1	20	24	14,079 21	7,299 53
New York, northern district	100 00	1,225 82	2	2	8		41	53	3,865 00	3,807 04
New York, southern district	699 13	15,608 92	12	35	577		56	868	13,026 34	36,935 29
New York, eastern district			5		1		30	32	1,150 19	80 32
North Carolina, eastern district	5,276 00	337 65	59		4		60	65	5,356 00	337 65
North Carolina, western district	5,228 12	1,070 08	19	1	17		48	87	12,008 12	1,076 94
Ohio, northern district	5,502 54	522 32	1		1		22	24	6,919 79	1,803 82
Ohio, southern district	17 70	1,069 99	1	1	12		23	43	3,477 36	4,291 68
Oregon	1,100 00	200 00	2	1	1		102	105	4,233 09	2,495 04
Pennsylvania, eastern district	65,900 00	989 19	5	8	30		41	91	71,313 50	2,078 58
Pennsylvania, western district		661 27	1				40	49	5,843 57	3,073 22
Rhode Island							1	1	25 00	
South Carolina	300 00		2				7	8	800 00	275 95
Tennessee, eastern district	6,612 18	368 34	8		14		16	39	7,819 58	368 34
Tennessee, middle district	4,657 37	91,414 13	14	1			27	32	5,533 22	91,414 13
Tennessee, western district	1,089 05	315 11	4				21	24	2,933 57	1,017 15
Texas, northern district	1,950 00	48 63	5		4		15	25	2,416 00	347 27
Texas, eastern district	800 00	76 00	4		1		8	10	1,313 10	138 10
Texas, western district	21,257 61	1,240 90	10		4		40	44	23,390 61	1,837 00
Vermont		3,100 00			1		9	10	2,079 00	3,217 00
Virginia, eastern district		398 75	1		6		4	11	140 00	538 75
Virginia, western district	1,205 00		12		13		13	27	1,405 00	
West Virginia	5,651 64	868 45	13		1		19	20	7,049 11	881 10
Wisconsin, eastern district	5,393 59	356 10	3		2		19	22	5,811 34	771 52
Wisconsin, western district	2,012 95	1,691 51	7		1		26	28	4,921 93	2,642 79
Arizona		3,924 27			1		6	7	2,200 00	5,799 27
Dakota		52 73			1		26	28	5,181 00	3,253 73
Idaho							1	2	24 00	24 00
Montana		511 84						1		511 84
New Mexico	1,836 99	1,210 10	8		1		11	12	2,592 69	1,210 10
Utah								1		111 53
Washington		2,759 90	2				28	29	3,255 97	4,399 26
Wyoming								1		
District of Columbia	26,621 15	8,391 81	3		4		3	8	26,621 15	8,612 56
Total	312,759 54	272,651 22	422	81	841	1	1,757	3,157	490,826 31	356,207 23

No. 8.—*Statement showing the number of suits in which the United States was a party or had an interest, commenced in each year from the establishment of the office of the Solicitor of the Treasury to June* 30, 1881; *also, the aggregate amounts claimed in said suits, together with the aggregate sums collected in each of said years.*

Years.	Number of suits commenced.	Amount claimed.	Amount collected.
1830	403		
1831	165		
1832	615		
1833	457		
1834	447		
1835	282		
1836	430		
1837	4,570		
1838	1,089		
1839	1,319	$25,494,359 00	$6,210,720 93
1840	804		
1841	418		
1842	614		
1843	387		
1844	421		
1845	447		
1846	364		
1847	250		
1848	155		
1849	102	277,310 26	4,766 24
1850	91	229,583 59	29,987 30
1851	352	131,379 87	48,002 52
1852	437	290,281 18	14,345 97
1853	84	211,193 16	28,112 41
1854	586	667,560 56	351,235 59
1855	918	705,745 68	436,722 17
1856	747	1,271,040 35	517,404 64
1857	520	1,130,979 78	748,532 07
1858	726	2,054,092 11	398,064 09
1859	744	916,492 84	1,246,805 71
1860	760	751,704 86	434,201 32
1861	529	44,279 16	343,346 46
1862	1,072	1,463,229 55	461,438 87
1863	2,051	1,066,939 05	*a*2,997,709 45
1864	2,604	856,644 34	*b*7,985,532 91
1865	2,348	2,199,527 35	*c*9,558,621 42
1866	4,672	*d*8,066,629 65	*e*4,577,363 76
1867	3,873	*f*13,582,619 22	2,620,696 69
1868	2,004	10,970,147 59	644,517 42
1869	2,169	10,087,346 98	719,795 24
1870	1,868	5,367,007 44	477,025 37
1871	2,116	12,604,601 01	1,289,920 06
1872	1,854	8,567,185 11	1,000,422 41
1873	2,715	7,758,168 59	778,252 17
1874	2,986	10,117,653 50	1,113,112 39
1875	2,734	10,160,212 91	621,950 18
1876	2,339	7,001,358 77	868,198 41
1877	1,874	*g*14,073,031 17	2,052,973 58
1878	2,326	2,340,811 35	364,537 44
1879	2,060	3,755,831 39	608,632 02
1880	2,399	1,566,307 86	448,871 41
1881	2,716	1,366,758 73	875,564 48
1882	2,941	1,625,107 21	488,995 53
1883	2,703	1,947,573 13	1,324,529 92
1884	3,216	1,654,303 86	356,207 23
Total	78,175	172,774,998 16	53,047,115 88

a $2,665,276.01 of this collection were in prize and confiscation cases.
b $7,700,412.60 of this collection were in prize and confiscation cases.
c $9,055,867.41 of this collection were in prize and confiscation cases.
d $1,416,232.42 of this amount were in internal-revenue cases, since 1867 under control, by law, of the Commissioner of Internal Revenue.
e $2,440,860.12 of this collection were in prize and confiscation cases.
f $4,513,806.44 of this amount were in internal-revenue cases, since 1867 under control, by law, of the Commissioner of Internal Revenue.
g $10,876,600 of this amount involved in six suits against the Kansas Pacific Railroad Company to recover moneys illegally obtained from the United States.

Statement of real property in charge of the Solicitor of the Treasury acquired in the collection of debts due the United States during the fiscal year ending June 30, 1884.

When acquired.	From whom acquired.	Description.	Where situated.
Oct. 30, 1883	M. McElroy.....	Lot 1, block 104, and lot 11, block 120, in the city of Fort Scott	Bourbon County, Kansas.
Jan. 10, 1884	James A. Moody	1,476 acres, being one-third of a league originally granted to James A. Moody.	De Witt County, Texas.
Jan. 10, 1884	James A. Moody	1,326 acres on Little Brushy Creek, being part of a tract originally granted to John Govilli.	De Witt and Lavaca Counties, Texas.
Jan. 10, 1884	James A. Moody	Lots 1, 2, 3, and 4, in block 39; lots 1, 2, 3, and 4, in block 229; lots 1, 2, 3, and 4, in block 230; all in the town of Victoria.	Victoria County, Texas.
Jan. 10, 1884	James A. Moody	The undivided one-half of 2,214 acres, being the lower half of the league of land on the west side of the Guadalupe River, originally granted to Leonardo Rodriguez.	Victoria County, Texas.
Jan. 31, 1884	John Justice....	Land lots 43 and 44, in second district, fourth section, with improvements thereon.	Rabun County, Georgia.
Jan. 31, 1884	W. W. Chapman.	Land lots 75 and 103, in ninth district, first section, with improvements thereon.	Union County, Georgia.
Jan. 31, 1884	S. T. Walden....	Land lots 744 and 769, in eleventh district, first section, with improvements thereon.	Lumpkin County, Georgia.

Statement of real property in charge of the Solicitor of the Treasury sold under the provisions of section 3749, *Revised Statutes, during the fiscal year ending June* 30, 1884.

When and from whom acquired.	Description.	When and to whom sold.	Amount sold for.
Oct. 23, 1852; Lewis Clemens.	100 acres of land in town of Hyde Park, Lamoille County, Vermont.	Nov. 23, 1883; A. M. Goodrich.	$100 00
Sept. 17, 1859; John Alexander.	S. ½ NW. ¼ Sec. 27, T. 85 N., R. 10 W., in Benton County, Iowa.	May 14, 1884; James B. Locke.	150 00
Feb. 7, 1867; Cornelius Curtis.	A tract of 401 acres of land in President Township, Venango County, Pennsylvania.	Aug. 15, 1883; I. N. Patterson and A. G. Egbert.	3,308 25
Feb. 7, 1867; Cornelius Curtis.	An island in the Allegheny River, in President Township, Venango County, Pennsylvania.	Aug. 15, 1883; Eli Holeman.	520 00
Feb. 7, 1867; Cornelius Curtis.	A tract of 391 acres of land in Tionesta Township, Forest County, Pennsylvania.	Aug. 15, 1883; I. N. Patterson and A. G. Egbert.	3,147 75
June 17, 1872; R. and L. D. Snay.	N. ½ of lot 29 and lot 30, in Andre's addition to the city of Saginaw, Mich.	Jan. 5, 1884; L. D. Snay and M. Schmitter.	100 00
Mar. 20, 1879; Parnell Munson.	Lots 67, 68, 69, 70, and 71, in Walker's subdivision of S. ½ of NW. ¼, block 11, and trustees' subdivision of E ½ of Sec. 31, T. 39, R. 14 E., in Cook County, Illinois.	July 26, 1883; E. F. Runyon.	250 00
Apr. 10, 1882; V. B. Albritton.	SW. ¼, Sec. 25, T. 6, R. 4 E., in Marshall County, Kentucky.	Feb. 29, 1884; S. S. Tuttle.	456 50
Apr. 10, 1882; V. B. Albritton.	SW. ¼, Sec. 36, T. 6, R. 4 E., in Marshall County, Kentucky.	Feb. 29, 1884; B. W. Hawkins.	498 00
	Total	.....	8,524 50

Statement of real property in charge of the Solicitor of the Treasury, the title to which has been relinquished as stated below.

When and from whom acquired.	Description.	To whom and by what authority interest of United States relinquished.
Mar. 24, 1858; Philip Barton Key, trustee of Robert Brent, deceased.	One-half of squares 710 and 711; the undivided one-third of the remaining half of squares 710 and 711; all of squares 670, 671, and 672, in the city of Washington, D. C.	Title released to the heirs, &c, of Joseph Pearson, pursuant to act of Congress of August 4, 1882.
May 17, 1869; Robert C. Gorthy.	NW. ¼ of NW. ¼ of Sec. 17, T. 6 N., R. 1 W., E. ½ of NW. ¼ Sec. 17, T. 6 N., R. 1 W., in Clinton County, Michigan.	Title released to Robert C. Gorthy, pursuant to act of Congress of January 17, 1883.
May 17, 1869; Calvin E. Green.	SW. ¼ of NW. ¼ Sec. 17, T. 6 N., R. 1 W.; NE. ¼ of SE. ¼ Sec. 18, T. 6 N., R. 1 W., in Clinton County, Michigan.	Title released to Calvin E. Green, pursuant to act of Congress of January 17, 1883.
Aug. 20, 1880; John G. James.	SE. ¼ of SE. ¼, and part of SE. ¼ of NE. ¼, and NW. ¼ of SE. ¼, Sec. 23; W. ½ SW. ¼ and SW. ¼ of NW. ¼, Sec. 24; part of SW. ¼ of NE. ¼, Sec. 26; E. ½ of NE. ¼ of SW. ¼ and W. ½ of SE. ¼, Sec. 31, in T. 7 N., R. 6 E, in Effingham County, Illinois.	Redeemed by judgment debtor under provisions of section 18, chapter 77, R. S., Illinois, 1874.

Statement of real property heretofore reported as belonging to the United States, the title to which has been found on examination to be invalid.

ILLINOIS.

When reported acquired.	From whom reported acquired.	Description.	Where situated.
—— —, 1823	Bank of Missouri..	345 acres of land on an island in the Mississippi River, about 8 miles north of the city of Saint Louis, Mo.	Madison County.
Apr. 10, 1839	John McFadon ...	SE. ¼ Sec. 8, T. 7 N, R. 4 E	Fulton County.
		SW. ¼ Sec. 20, T. 9 N., R. 4 W.....	Henderson County.
		NE. ¼ Sec. 32, T. 15 N., R. 6 E	Bureau County.
Dec. 17, 1844	Joseph Duncan's heirs.	SE. ¼ Sec. 18, T. 5 N., R. 3 E.; SE. ¼ Sec. 7, T. 7 N., R. 4 E.	Fulton County.
		NE. ¼ Sec. 28, T. 11 N., R. 1 W.; NE. ¼ Sec. 34, T. 10 N., R. 3 W.	Warren County.
		SE. ¼ Sec. 35, T. 9 N., R. 4 W.; NE. ¼ Sec. 21, T. 9 N., R. 5 W.; NW. ¼ Sec. 29 T. 11 N., R. 4 W.	Henderson County.
Oct. 10, 1845	Sureties of J. W. Stephenson.	W. ½ SW. ¼ Sec. 36, T. 35 N., R. 1 E	La Salle County.
Jan. 15, 1846	M. E. Rattan & T. Worthington.	Fractional E. side of E. ½ of Sec. 7, T. 4 S., R. 5 W.	Pike County.
Jan. 15, 1846	H. Fellows & R. H. Burton.	NW. ¼ Sec. 35, T. 2 S., R. 4 W.; NE. ¼ Sec 17, T. 2 S., R. 4 W.; fractional E. side of SW. ¼ of Sec. 30, T. 1 N., R. 2 W.	Brown County.
Jan. 15, 1846	J. C. Brewer.....	The undivided ½ of NE. ¼ of SW. ¼ Sec. 5, T. 6 N., R. 12 W.	Jersey County.
Dec. 30, 1846	O. W. Kellogg...	Blocks 9 and 10 in the village of Buffalo, Fractional part of Sec. 17, T. 23, R. 8 E.	Ogle County.
Nov. 1, 1848	Elizabeth C. Duncan *et al.*	SW. ¼ Sec. 23, T. 3 N., R. 7 W.....	Hancock County.
June 4, 1859	Sureties of Edward Moran.	The undivided ¼ of SE. ¼ Sec. 34, T. 13 N., R. 3 W. The undivided ¼ of E. ½ SW. ¼ Sec. 34, T. 13 N., R. 3 W. The undivided ¼ of NW. ¼ SW. ¼ Sec. 34, T. 13 N., R. 3 W. The undivided ¼ of E. ½, NW. ¼, Sec. 34, T. 13 N., R. 3 W.	Mercer County.
Nov. 15, 1878	Henry Wagner...	Lots 11 and 13, in block 20, in Carpenter's addition to city of Chicago.	Cook County.

IOWA.

Sept. 17, 1859	John Alexander ..	SW. ¼ of SW. ¼ Sec. 14 T. 85 N., R. 10 W.	Benton County.

Statement of real property heretofore reported as belonging to the United States, &c.—Cont'd.

KENTUCKY.

When reported acquired.	From whom required.	Description.	Where situated.
Oct. 18, 1867	George Jones.....	5 acres of land on the old Litchfield road, about half a mile SE. of Owensborough.	Daviess County.

MICHIGAN.

Sept. 7, 1858	Oliver M. Hyde...	Lot 78, in section 8, in the city of Detroit.	Wayne County.

MISSOURI.

Mar. 5, 1872	Peter W. Bowen..	The undivided ½ of lot 36, on NW. cor. of the public square, in the town of Calhoun.	Henry County.

NEW JERSEY.

Aug. 23, 1833	Felix Peltier, *et ux.*	One quarter interest (in common with F. G. Burnham) in 30 acres of land in township of Rahway.	Essex County.

NORTH CAROLINA.

July 5, 1882	E. Anderson.....	150 acres of land adjoining the lands of Charles Hays, Martin Marlow, *et al.*	Wilkes County.

EXHIBIT Q.—*Report of United States marshal for the western district of Arkansas.*

UNITED STATES MARSHAL'S OFFICE,
WESTERN DISTRICT OF ARKANSAS,
Fort Smith, Ark., October 9, 1884.

SIR: I have the honor to acknowledge the receipt of your letter "W. H.," dated September 24, 1884, relative to a statement of the number of prisoners confined in the United States jail here, the average number usually confined here, together with a description of the rooms used for jail purposes, and what facilities I have for the care of such prisoners.

Before proceeding to make the statement you desire, I beg to say, by way of explaining the delay of answering, that your letter was received just as I was departing to Detroit, Mich., to transport there under sentence of the court, 31 convicts. Now, upon my return I hasten to comply with your desire, and respectfully submit the following statements relative to the United States jail here, and prisoners confined therein, from

the 1st day of January, 1884, to and including the 30th of September, 1884, a period of nine months:

Date.	Number in jail first of month.	Committed during month.	Confined during month.
1884.			
January 1	78	17	95
February 1	53	61	114
March 1	74	66	140
April 1	102	41	143
May 1	80	68	148
June 1	90	30	120
July 1	51	64	115
August 1	77	66	143
September 1	106	41	147
Total during nine months		454	
Number in jail January 1		78	
Total confined during nine months		532	

The total number of days these prisoners remained in jail during this period was 21,599, which being divided by 274, the number of days in that period, gives us a daily average number in confinement of 78.82+.

The cells in which the men and boys are confined are constructed in the basement of the soldiers' old abandoned barracks here (the United States court and the offices of the United States officials being in the same building).

The building is about 60 feet square, outside measurement, and is divided by a partition-wall through the center, making two cells. The basement of the building is made of stone, the walls being 2½ feet thick. Above the basement the building is of brick, the roof being originally covered with slate, but is rapidly getting out of order, needing repairs. The bottoms of the cells are covered with flag-stones, which are about 2½ feet below the surface of the earth; length of cells, 55 feet; breadth, 29 feet; height, about 7 feet. The main doors to the cells are 6 feet 3 inches high by 4 feet wide.

The windows in the front of the cells are 6 feet and 4 inches high by 3 feet and 3 inches wide, those in the rear end of the cells being not quite so large. There are four windows in front and four in the rear of each cell. There is also a small door in the rear of each cell, but they are not used, and hence are kept securely closed. The front doors are secured by two shutters, the one on the inside being of heavy wood, that on the outside being of bar-iron. Inside each cell, and including each front door, is built, of light boards, a small room, out of which a door opens into the cell. These rooms were built as a protection to the front doors and to prevent a rush being made by the inmates upon the turnkeys, &c., and in these rooms the lawyers see and consult with their clients.

I herewith submit a diagram of the jail, which will more fully explain its arrangement, and I respectfully ask that it may be made and taken as a part of this statement. When females are committed I place them in a small brick house formerly used by the military authorities as a guard-house, and its being about 75 yards from the front of the jail necessitates the employment of an additional guard at night during their imprisonment.

There being only two cells of equal size, I am compelled to confine all criminals and those only charged with misdemeanors together in the same cell without regard to age, charge, or physical condition. The

youth of tender years, often charged with only a misdemeanor, is confined for months with the condemned murderer and desperado. Besides this, we have no place to keep the sick and wounded separate from the wild, noisy, and unfeeling crowd around them.

When the weather is not too warm I sometimes have the sick taken to a room in the attic over the court-room, but this requires additional help to take care of them. At the risk of being criticised for not sticking strictly to the subject in hand, I will state that through the philanthropic kindness of the ministers of the Gospel and some of the Christian ladies and gentlemen of this city, we have preaching and Sunday schools in each cell every Sabbath.

The cooking and washing for the jail are done in a little old board house about 75 yards away. The facilities for cooking and the cooking are of course supplied by Mr. Ayres, who subsists the prisoners for me. We have some common pots or kettles with which water is heated in some old fire-places in this house, to do the washing for the jail and prisoners, using coal-oil barrels sawed in two equal parts for washtubs. I have no means of giving the prisoners baths, except to bathe their hands and faces as indicated in the diagram, without allowing them to take a sit-bath in the cell, using a half barrel for the tub.

The urinal tubs, which take the place of the earth closet shown in the diagram at No. 3, with the slop-tubs from the washstands, shown at 4 in the diagram, are removed twice a day, and carried outside the walls of the fort some distance and emptied into pits dug for that purpose.

Situated as the jail is, it is only with the most rigid and vigilant attention to its cleanliness and the free use of disinfectants, principally in the shape of lime, that I have been able to keep up the good health of its inmates. I have often feared that some contagious disease would get into the jail, and if it did it would be impossible to suppress it without taking the prisoners away from it. Some time ago, when the small-pox was raging in the Creek and Cherokee Nations, I for a time withdrew my deputies from the infected districts, from the fear of introducing the disease into jail.

The only place we have for an office for the jailor is a little board shanty near the front of the guard-room. It is only about 9 by 10 feet in size, and is inadequate and unfit for the purpose.

There is no store-room for the jail, and such property as belongs to it and to its inmates I have packed away in the attic of the court-room and in the jailor's office.

Very respectfully, your obedient servant,

THOMAS BOLES,
United States Marshal.

Hon. BENJAMIN H. BREWSTER,
Attorney-General United States,
Washington, D. C.

Ground plan of United States jail at Fort Smith, Arkansas.

1. Main doors to cells, secured by wood door on the inside of the wall and iron-bar door on the outside.
2. Box rooms inside cells, to prevent rush being made upon the front doors, and used for attorney to consult clients.
3. Urinal tubs set in old fire-places with doors, flues to top of building.
4. Sinks for washing face and hands.
5. Old doors, now closed and not in use
6. Windows, barred with iron both inside and outside the walls.
7. Stoves in cells and guard-rooms.

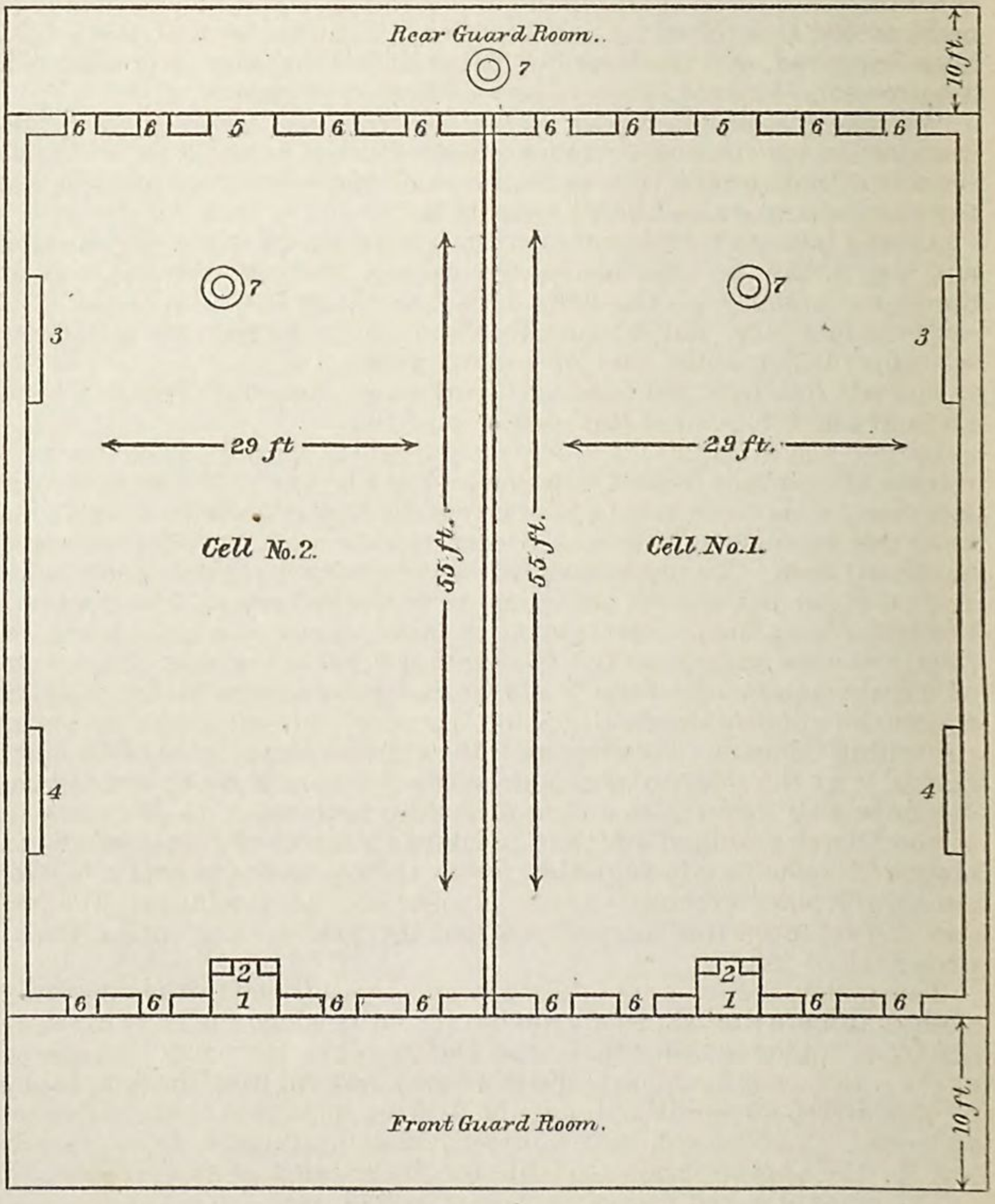

EXHIBIT R.—*Report of the president of the Board of Trustees of the Reform School of the District of Columbia.*

REFORM SCHOOL OF THE DISTRICT OF COLUMBIA,
Washington, October 20, 1884.

SIR: I beg herewith, in compliance with law, to submit the fifteenth annual report of the school, being for the fiscal year ending June 30 last.

While the year has passed without unusual incident, the school has constantly improved in discipline under the kind and efficient management of the superintendent and matron, the buildings and lands have been improved, and the Board of Trustees feel that the institution is in a better condition for effective service than ever before.

We take pleasure in reporting that no death has occurred among the inmates during the year. At its commencement typhoid fever largely prevailed, but through the skillful care of the attending physician all the boys who had the disease recovered.

As will be seen by the full and interesting report of the superintendent, the number of boys committed during the year was 103, and the number remaining on the 30th June, 1884, was 163, an increase of 23 over the last year. Of the committals much the larger number, viz, 40, were for incorrigibility and 20 were for larceny.

The receipts from the farm and workshop amounted to $3,662, being an increase of $350 over last year.

Larger accommodations are greatly needed, not only to enable us to receive all applicants for admission and not be compelled as now to reject many cases, but also to properly classify the present inmates and keep the smaller boys from the contamination of the older and more hardened ones. To accomplish this another family building is needed, and an appropriation for this purpose was asked of the last Congress, but without success. The amount requisite to put up a chapel building (which is also greatly needed) Congress also failed to grant. The Board of Trustees most respectfully and most urgently request that you will renew the application for these much-needed appropriations to the approaching Congress, and emphasize the extreme importance of favorable action. As the enlarged accommodation thus furnished, by giving room for boys who now for the want of it have necessarily to be committed to the District jail and are thus started on a career of crime, will be the means of a great saving of public funds—to look at the matter solely in a pecuniary point of view—we do not see how an intelligent Congress can fail to appreciate the policy, if not the justice, of granting the appropriations asked.

To render the training still more effectual for good, it is very desirable that more workshops should be erected in which the boys can learn different trades in order that, after their release, they may be prepared at once to earn a livelihood, and thus, also, be kept from the temptations of idle street-life and the danger of drifting back into their former evil courses. The Board do not, however, deem it advisable to ask at present for the appropriation requisite for the erection of such shops.

The amount asked from Congress is as follows:

For one family building of brick or stone	$12,000
For a chapel building of stone	4,500
For permanent repairs and improvements	1,800
For draining and grading school grounds	1,000
Total	19,300

The amount asked is somewhat in excess of that applied for last year, because of the enhanced price of labor and building material.

To be able to comply with the expressed wish of your Department that minors sentenced by the Federal courts outside the District of Columbia may be sent to this school, an amendment to the act of Congress incorporating the school is necessary, as, at present, committals can be made only by the courts in the District, or by the president of the Board of Trustees. It might be well, therefore, to ask for the needed amendment from the next Congress.

The report of Col. G. A. Shallenberger, the superintendent, and that of the secretary and treasurer of the Board, Mr. S. W. Curriden, as well as the report of Dr. Wells, the attending physician, are here submitted.

I have the honor to be, your obedient servant,

JAMES E. FITCH,
President Board of Trustees.

Hon. BENJAMIN HARRIS BREWSTER,
Attorney-General of the United States.

Report of the superintendent.

REFORM SCHOOL OF THE DISTRICT OF COLUMBIA,
October 15, 1884.

To the Board of Trustees:

GENTLEMEN: I have the honor herewith to submit the fifteenth annual report of the condition and wants of the institution for the fiscal year ending June 30, 1884:

Whole number of boys received since opening	989
Whole number of deaths since opening	7

Rate of mortality, less than three-fourths of 1 per cent.

	Years.
Average age of boys received since opening	13.4
Age of oldest boy when received	19
Age of the youngest boy when received	6

Number of boys in institution June 30, 1883		140
Committed and received during the year:		
By the supreme court	10	
By the police court	60	
By the United States circuit court	6	
By the president of Board of Trustees	24	
Returned to the school	3	
	—	103
Total population during the year		243
Received on first commitment		97
Received on second commitment		6
		103

	Years.
Age of oldest boy received during year	19
Age of youngest boy received during year	8
Average age of boys received during year	13.6
Maximum number during the year	168
Minimum number during the year	133
Average number during the year	153

Number discharged during the year:		
By order of the Board of Trustees	72	
By order of the court	4	
By order on physician's certificate	2	
By escape, still absent	2	
		80
Number remaining June 30, 1884		163

Average age of boys discharged during year, 15 years, 2 months; average time served by discharged boys, 1 year, 8 months; longest time served by any one boy, 6 years; aggregate of time served by six oldest boys, 29 years.

Nativity of boys received during the year:	
American parentage	80
Irish parentage	12
German parentage	6
Italian parentage	1
English parentage	1
Canadian parentage	2
Spanish parentage	1
Total	103

Parental relations of boys received:	
Number having father and mother both living	65
Number having lost father by death	38
Number having lost mother by death	29
Number having lost both parents	23
Number having parents living in separation	15
Number having stepfathers	5
Number having stepmothers	7

Age of boys received during the year:	
Number at eight years	4
Number at nine years	3
Number at ten years	5
Number at eleven years	7
Number at twelve years	15
Number at thirteen years	11
Number at fourteen years	18
Number at fifteen years	22
Number at sixteen years	14
Number at seventeen years	2
Number at eighteen years	1
Number at nineteen years	1
Total	103

Causes of commitment:	
Incorrigibility	40
Larceny	20
Petit-larceny	9
Vagrancy	15
Altering United States Treasury notes	1
Robbing United States mails	5
House-breaking	8
Malicious trespass	1
Disorderly assembly	2
Manslaughter	1
Assault	1
Total	103

Religious training of boys before commitment:	
Parents attend Baptist church services	30
Parents attend Catholic church services	19
Parents attend Episcopal church services	7

Parents attend Hebrew church services	1
Parents attend Methodist church services	25
Parents attend Presbyterian church services	5
Parents attend Congregational church services	2
Parents attend Lutheran church services	2
Parents who did not attend any church services	12
Total	103

Education of boys when received:

Number who did not know the alphabet	13
Number who knew the alphabet only	15
Number who could spell easy words	20
Number who could read indifferently	40
Number who could read well	15
Total	103

Number who could not write	48
Number who could write imperfectly	20
Number who could write legibly	25
Number who could write well	10
Total	103

Number who had never studied arithmetic	70
Number who had advanced to multiplication	15
Number who had advanced to long division	12
Number who had advanced to fractions	6
Total	103

FINANCIAL STATEMENT.

The superintendent has received from various sources the sum of $3,662.81, and has expended the same upon vouchers approved by the committee of finance, as follows:

RECEIPTS.

Received from sales of farm produce	$626 92
Received from sales of fruits	557 49
Received from chair-shop account	2,271 82
Received miscellaneous sources	206 58
Total	3,662 81

EXPENDITURES.

February 1, S. W. Curriden, treasurer	$1,900 67
February 13, S. W. Curriden, services	150 00
March 11, Peter Crowe, wages	30 00
March 11, William McDevitt, wages	12 00
April 1, Peter Crowe, wages	30 00
April 1, William McDevitt, wages	12 00
April 4, S. W. Curriden, services	150 00
April 26, John Dugan, crocks	10 00
May 1, Peter Crowe, wages	30 00
May 1, William McDevitt, wages	12 00
May 1, J. F. Gantt, wages	20 00
May 1, John Brown, wages	21 00
May 24, R. J. Kennedy, coal	139 00
May 24, William McDevitt, wages	8 50
June 1, Peter Crowe, wages	30 00
June 1, Marianne Suddington, wages	3 50
June 1, John Brown, wages	24 00
June 6, George Y. Hansell, papering	39 70
June 30, S. W. Curriden, services	150 00
June 30, E. R. Myers, photographs	55 00

June 30, S. W. Curriden, office desk	$72 50
June 30, John McDermott & Son, for carriage	300 00
June 30, John A. Erdman, wages	5 00
June 30, Johnson Brothers, coal	56 00
June 30, Thomas Somerville & Son, boiler, &c	282 65
June 30, George M. Barker, lumber	118 50
Total	3,662 02
Balance unexpended June 30, 1884	79
Total	3,662 81

Estimates for the fiscal year ending June 30, 1886, have been made, and forwarded to the honorable the Commissioners of the District of Columbia, as follows:

For subsistence and general supplies, including ordinary repairs to building, live-stock, fencing, fertilizers, &c	$25,000
For salaries of officers and employés, including secretary and treasurer of the school	11,640

For the fiscal year ending June 30, 1886, the receipts from the school and farm will be covered into the treasury of the District of Columbia.

Estimates for new buildings and permanent repairs have also been made and forwarded to the Hon. Benjamin H. Brewster, Attorney-General of the United States, as follows:

For one family building, of brick and stone	$12,000
For one chapel building, of brick and stone	4,500
For permanent repairs and improvements	1,800
For draining and grading school grounds	1,000
Total for permanent buildings and improvements	19,300

The necessity for these improvements has been laid before Congress regularly during the past number of years. One of our present buildings has been too crowded for either health or comfort during all this time. For months together the courts have been compelled to send very young children to the jail, and even to the work-house, because there was no room to receive them here. As may be seen on another page of this report, our number of boys has largely increased over the previous year. With these facts in view, I earnestly request that you again press upon Congress, at its next session, the justice of our claims, and, if possible, secure favorable consideration of the same.

The schools have held regular sessions throughout the year, with the exception of the usual vacation during the warm summer months.

Each family of boys occupies a separate building, which contains dormitories and living accommodations for themselves and the officers in charge. The school sessions are also held in rooms provided for such purpose in the same buildings. The present organization is as follows:

Family A, occupying family building. Officers and teachers in charge, Samuel R. McMorran and Isaac D. Porter. Number of boys in family, 93.

Family B, occupying south wing of main building. Officers and teachers in charge, George O. Atherton and Edward B. Taylor. Number of boys in family, 70.

A comparatively small number of boys, when first admitted to the school, are prepared to enter the highest grade. Many of them possess good natural ability, some of them much above the average, but they have failed to take advantage of their opportunities to attend the public schools, open and free to all. They seem to prefer manual labor, even the commonest drudgery, to mental exertion of any kind, and are never quite at home or entirely happy in the school-room. We cannot

hope to see these boys make rapid progress in their studies. Reasonably enough we may expect to get more than a fair proportion of tardy scholars, as they are often sent to us for no other cause than a willful and persistent neglect of school privileges at home.

On the other hand, we always have a few boys who astonish their teachers and classmates by their rapid progress in study. We might note instances where boys scarcely ten years of age, and who did not know a single letter of the alphabet, have been advanced to the second reader class in a few months. These youthful waifs, vagrants almost from their birth, have never attended school. To them the very novelty of books seems to prove an incentive to study, while their voluntary application secures a steady and rapid advancement. Altogether there is much to encourage the faithful teacher in his daily work.

With few exceptions our discharged boys can all read and write; many of them can recite the multiplication table, while a fair proportion are prepared to enter and maintain a position in the higher grades in the public schools.

The farm products have been largely increased over any former year, and but for the enlarged facilities afforded by our new farm buildings, finished and occupied during the year, the crops could not have been properly sheltered. The root crops have been especially abundant, and the ample cellars provided for their winter keeping have been filled to overflowing.

The orchards and vineyard have yielded more than an average crop. There has been an ample supply of fruits in their season, while a large surplus was disposed of to profit in a distant market.

The various kinds of small fruits planted more than a year ago came into first bearing this season, and will doubtless furnish a large surplus during the coming year.

Of choice garden vegetables and in great variety we have had more than our wants required during the entire season. During the summer months especially our tables are well supplied with this kind of food, taken fresh from the garden every day, and consisting of white potatoes, sweet potatoes, tomatoes, sweet corn, cabbage, lettuce, peas, beans, onions, beets, parsnips, radishes, carrots, rhubarb, cucumbers, celery, asparagus, cymlings, squashes, melons, and, in brief, almost everything that can be raised to profit in our soil and climate.

These, in addition to a generous meat diet, including Potomac herring and shad, fresh in their season, together with wheat bread, butter, cheese, sirup, coffee, tea, milk, &c., each in its proper order of time, have furnished palatable and wholesome food for our entire population during the year.

The same industries have been pursued as during the past year. Chair caning is our largest source of income, and gives suitable employment to all our younger boys for at least one-half of their time.

The older boys assist with the necessary outdoor labor, the farm and vegetable garden claiming most of their working time, at least during the summer months. This is healthful and honorable employment, and it is only the naturally idle or lazy boys who do not prefer it to any kind of manual labor we have to offer them.

No effort is made to enforce an excessive or unreasonable service in any department of the school. Our working hours are not lengthened merely to secure increased moneyed returns, and no working day passes that does not furnish to every boy opportunities for a due proportion of rest and recreation.

During the winter months, and while the school sessions divide equally

the working hours of every day, the long evenings are frequently spent in the school-room, listening to select readings and recitations, in writing home letters, or in the enjoyment of innocent games and amusements.

The boys themselves generally furnish the principal actors in these evening entertainments.

It is through such efforts and by such means that we labor to introduce into our otherwise monotonous every-day life something that may serve to give variety, and help to break up, at stated intervals, under proper restraints, the daily routine required to sustain ordinary discipline. The government of a well-regulated home is accepted as the model, and thus becomes the standard of our highest endeavors in the management of the school.

In addition to the regular work on the farm and in the chair shop, other necessary industries have received due attention.

Our tailoring and shoe departments have had each a force of boys engaged in the manufacture of suitable clothing for their own wear. The work, of course, is done under the immediate instruction of competent persons, who are held responsible for the economical use of materials provided, as well as for the amount and quality of the labor performed.

Under the direct supervision of the laundress, assisted by a number of boys, all the labor of this kind required by the school is satisfactorily performed. During the year a very large number of pieces are washed and ironed every week, in a separate building provided for the purpose, and supplied with the best mechanical appliances.

The cook, also, and the baker, have their special departments to supervise, as they prepare the daily supply of food for all our tables. In this necessary labor they are assisted by a force of boys permanently detailed for the purpose, who sometimes become very proficient in their work, and for whom places of a similar kind are often in waiting on their discharge from the schools.

Religious services have been held regularly every Sabbath afternoon at 3 o'clock in the large school-room in south wing of main building. Ministers from the city and neighborhood, and others gifted in the art of speaking to boys, have generously visited the school upon these occasions to conduct the services. These exercises consist usually of scriptural readings and expositions, of prayer and praise, and are in no sense sectarian in character.

Our Sabbath schools are also held every Sabbath morning in the family school-rooms and are under the immediate direction of the teachers in charge. The International Lesson papers continue to furnish the subjects for this hour of Bible study, while the familiar hymns selected from the recent standard publications are used almost exclusively in our service of song.

The general health of the school has been uniformly good during the last nine months of the year. The months of July, August, and September, however, were marked exceptions, for during this time our hospital was never without a patient. Quite a number of our boys were very sick with typhoid fever, some of them dangerously so, but under skillful medical treatment and careful nursing they all recovered.

Dr. Charles A. Wells, the attending physician, made daily visits to the schools during these months of unusual sickness, and was always prompt to respond to every call made upon him day and night. For special information concerning his department I refer you to his annual report.

The institution has been honored during the year by a number of distinguished visitors, including members of the United States Senate and House of Representatives, the District Government, and the Department of Justice, to whom your annual reports are made.

Representatives also from other schools and institutions, some of them located in far distant States, have come to see and counsel with reference to possible improvement in the common objects and aims of our peculiar work. It is by the free interchange of thought and opinion, and by honestly comparing our individual experiences, that we must hope for permanent advances in the moral and educational training of those committed to our care and government.

Many of our immediate neighbors and friends of the school, residing in the city and District, have strengthened our efforts by their presence, and have greatly aided us in the good work by their words of encouragement and sympathy.

Changes in our official force are only made for cause, or in the immediate interest of those concerned, and but few have occurred during the year.

Of my associates in the routine of daily duty and the obligations it has imposed, it gives me pleasure to speak in words of praise and commendation. To many of them I am indebted for ready and intelligent service in their special departments.

Finally, and in closing this, my third annual report, to you, gentlemen of the board of trustees, I beg to express my greatful acknowledgments for continued confidence in my willingness to serve you faithfully in your administration of the affairs of the Institution.

Under the Divine ruling our blessings have been many. May our gratitude be sincere.

Respectfully submitted.

G. A. SHALLENBERGER,
Superintendent.

REFORM SCHOOL, NEAR WASHINGTON, D. C.

Report of the treasurer.

REFORM SCHOOL OF THE DISTRICT OF COLUMBIA,
Washington, D. C., August 30, 1884.

SIR: I have the honor to hand you herewith a detailed statement of my receipts and disbursements as treasurer of the Reform School for the fiscal year ended June 30 last.

As appears thereby the sum of $18.86 remains in my hands to the credit of the school.

Very truly,

SAM'L W. CURRIDEN,
Treasurer.

JAMES E. FITCH, Esq.,
President Board of Trustees, Reform School, D. C.

Statement.

RECEIVED.

From appropriation for salaries	$10,936 00
From appropriation for subsistence	22,014 00
From appropriation for new barn, &c	7,500 00
From superintendent, &c., sale of farm produce, proceeds of work in shops, &c	1,900 67
From Department of Justice, support of boys committed by United States courts outside of District of Columbia	289 12
From repayment	1 00
Total	42,640 79

EXPENDED.

1883.		
July.	Geo. A. Shallenberger, pay-roll, July	$858 41
	Geo. A. Shallenberger, sundries	51 18
	Peter Crowe, wages	30 00
	Wm. McDevitt, wages	12 00
	Geo. G. Hansell, repairs	72 75
Aug.	C. Burlen, miscellaneous	732 50
	Woodward & Lothrop, dry goods	7 40
	J. Karr, clocks	7 50
	Thos. Somerville & Son, hardware	4 90
	J. T. Walker & Son, cement	4 00
	A. Saks & Co., clothing	30 46
	Washington Brick Machine Company, manure	29 60
	Eiseman Bros., clothing	37 00
	Geo. M. Oyster & Co., butter	70 72
	T. B. Hood, medical services	10 00
	M. W. Beveridge, tableware	8 98
	G. F. Swift & Co., beef	187 61
	Washington Gas Light Company, gas	31 50
	Chas. A. Wells, medical attendance	95 00
	Hume & Cleary, groceries	155 86
	Hume & Cleary, hardware	4 20
	Hood, Bonbright & Co., dry goods	134 07
	Browning & Middleton, groceries	205 51
	Geo. N. Holland, lime	14 45
	F. P. May & Co., hardware	15 25
	John U. O'Meara & Co., balls	5 40
	Geo. Watts, tableware	6 77
	Geo. Ryneal, jr., paints	9 25
	W. M. Galt & Co., flour	224 49
	C. W. Thorn & Co., sundries	29 63
	C. W. Thorn & Co., dry goods	9 30
	J. M. Lauxman, miscellaneous	11 60
	J. M. Lauxman, farm implements	24 95
	Geo. A. Shallenberger, pay-roll	902 48
	Geo. A. Shallenberger, sundries	59 27
	J. B. Olcott, hack hire	12 00
	Hume, Cleary & Co., miscellaneous	6 58
	Hume, Cleary & Co., groceries	174 43
	T. D. Daly, butter	32 25
	Geo. M. Oyster, butter	39 97
	Great Falls Ice Company, ice	6 00
	W. M. Galt & Co., flour	186 41
	G. F. Swift & Co., beef	167 16
	W. R. Riley, dry goods	106 07
	Woodward & Lothrop, dry goods	76 55
	A. Saks & Co., clothing	20 00
	H. Adler, agt., dry goods	25 23
	Peter Crowe, wages	30 00
	Wm. McDevitt, wages	12 00
	Thos. Brooks, wages	12 66
	Thos. Wilson, wages	16 67
	Auerbach & Co., clothing	14 33

1883.		
Aug.	Washington Gas Light Company, gas	$37 50
	F. P. May & Co., hardware	13 40
	M. W. Beveridge, tableware	27 70
	Geo. Watts, tableware	6 24
	Geo. N. Holland, miscellaneous	9 15
	Washington Brick Machine Company, manure	29 60
	Dan'l Hannan, plumbing	4 00
	Geo. Ryneal, jr., miscellaneous	4 55
	Stott, Cromwell & Co , medicine	25 69
	Chas. A. Wells, medical attendance	98 00
	C. F. Senkind, hardware	9 50
	C. W. Thorn & Co., dry goods	4 80
	T. B. Cross, fencing	76 25
	Geo. A. Shallenberger, sup't, pay-roll	903 83
	Peter Crowe, wages	30 00
	Wm. McDevitt, wages	12 00
	Thos. Brooks, wages	20 00
	S. W. Curriden, services	150 00
	Browning & Middleton, groceries	182 40
Oct.	Geo. A. Shallenberger, sundries	44 60
	Chas. A. Wells, medical services	38 00
	J. B. Olcott, hack hire	9 00
	Browning & Middleton, groceries	177 05
	Hume, Cleary & Co., groceries	112 39
	Barbour & Hamilton, groceries	44 44
	Geo. M. Oyster & Co, butter	44 23
	T. D. Daley, butter	28 40
	W. M. Galt & Co, flour	185 75
	G. F. Swift & Co., meat	147 28
	Woodward & Lothrop, dry goods	110 25
	W. R. Riley, dry goods	222 73
	Hood, Bonbright & Co., dry goods	57 46
	H. Adler, agent, dry goods	17 92
	Pitkins & Thomas, clothing	59 00
	A. Saks & Co., clothing	17 50
	Washington Gas Light Co., gas	52 50
	F. P. May & Co., hardware	23 00
	Geo. Watts, table ware	19 79
	Geo. N. Holland, wooden ware	7 05
	L. H. Sceneider & Son, hardware	11 88
	J. M. Lauxman, horse-shoeing	10 55
	Washington Brick Machine Co, manure	29 60
	Wm. Ballantyne & Son, stationery	8 39
	Thos. Somerville & Son, plumbing	23 52
	Geo. Ryneal, jr., oil and glass	36 17
	Great Falls Ice Co., ice	14 00
	Stott, Cromwell & Co., medicine	31 74
	R. J. Kennedy, coal	1,456 23
	J. S. Killmon, coal	378 65
	Johnson Eliot, medical services	50 00
	Geo. A. Shallenberger, pay-roll	906 33
	Peter Crowe, wages	30 00
	W. McDevitt, wages	12 00
	Thos. Brooks, wages	15 00
	Geo. A. Shallenberger, superintendent, sundries	53 31
Nov.	Browning & Middleton, groceries	142 36
	Hume, Cleary & Co., groceries	104 59
	T. D. Daley, butter	32 45
	G. M. Oyster, butter	67 80
	W. M. Galt & Co., flour	228 20
	G. F. Swift & Co., beef	132 16
	W. R. Riley, dry goods	171 77
	H. Adler, agent, dry goods	25 52
	A. Saks & Co., clothing	25 50
	C. H. Garden & Co., hats	118 49
	Robt. Cohen, shoes	29 70
	Washington Gas Light Co., gas	75 00
	J. M. Lauxman, horse-shoeing	15 85
	L. H. Schneider & Son, hardware	3 55
	W. B. Williams, furniture	245 74

1883.		
Nov.	Jno. A. Baker, seed	$5 00
	K. Kneessi, harness	19 25
	Washington Brick Machine Co., manure	29 60
	Thos. Somerville & Son, plumbing	35 50
	Geo. Ryneal, jr., oils	6 60
	Great Falls Ice Co., ice	9 00
	Stott, Cromwell & Co., medicine	23 93
	C. W. Thorn, miscellaneous	7 09
	Edwd. Fick & Co., oysters	13 20
	J. B. Olcott, hack-hire	10 00
	The National Republican, advertising	11 00
	The Washington Post, advertising	7 50
	H. W. McNeal, bookbinding	21 00
	Geo. A. Shallenberger, superintendent, pay-roll	903 85
	Peter Crowe, wages	30 00
	Thos. Brooks, wages	15 00
	Wm. McDevitt, wages	12 00
	Andrew Lynch, repairing	19 25
	Geo. A. Shallenberger, sundries	45 38
Dec.	B. P. Murray, entertainment	10 00
	Browning & Middleton, groceries	140 07
	Hume, Cleary & Co., groceries	158 78
	G. M. Oyster & Co, groceries	90 09
	W. M. Galt & Co., flour	200 40
	G. F. Swift & Co., meat	179 25
	Hume, Cleary & Co., meat	41 51
	Browning & Middleton, meat	52 13
	Edward Fick & Co., meat	14 58
	H. Adler, agent, dry goods	28 98
	A. Saks & Co., clothing	23 68
	Robt. Cohen, shoes	78 00
	M. W. Beveridge, table ware	16 52
	Geo. Watts, table ware	8 12
	Lansburg & Bro., furniture	42 00
	Washington Brick Machine Co., manure	29 20
	National Republican Co., stationery	15 00
	Wm. Ballantyne & Son, stationery	44 00
	Thos. Somerville & Son, plumbing	6 28
	Geo. Ryneal, jr., painting	5 55
	Tschiffley & Evans, medicine	13 38
	Carl Mueller & Son, miscellaneous	7 53
	Great Falls Ice Co., ice	10 00
	J. B. Olcott, hack-hire	9 00
	R. J. Kennedy, coal	99 75
1884.		
Jan.	Geo. A. Shallenberger, pay-roll	906 33
	Geo. A. Shallenberger, sundries	44 31
	M. W. Beveridge & Co., table ware	6 21
	Hume, Cleary & Co, groceries	103 27
	Hume, Cleary & Co., meat	47 44
	Browning & Middleton, groceries	82 49
	Browning & Middleton, meat	59 87
	Geo. M. Oyster & Co., butter	93 06
	W. M. Galt & Co., flour	245 15
	H. B. Kirkwood, meat	15 60
	Edward Fick, meat	4 80
	G. W. Swift & Co., meat	154 51
	H. Adler, agent, dry goods	17 39
	C. W. Thorn & Co., dry goods	4 80
	Woodward & Lothrop, dry goods	118 76
	Robt. Cohen, leather	50 85
	Washington Gas Light Co., gas	103 20
	Washington Gas Light Co., gas	69 30
	Johnson Bros., coal	21 00
	L. H. Schneider & Son, hardware	15 89
	L. H. Schneider & Son, fencing	8 59
	W. B. Williams, furniture	214 89
	C. F. Senkind, farm implements	13 50
	John A. Baker, farm implements	15 75
	J. M. Lauxman, farm implements	11 30

1884.		
Jan.	K. Kneessi, harness	$16 00
	H. A. Willard, president, manure	152 88
	Washington Brick Machine Company, manure	28 80
	Wm. Ballantyne & Son, stationery	9 37
	C. W. Brown, stationery	7 00
	Thomas P. Moore, stationery	2 00
	Geo. Ryneal, jr., plumbing, &c	17 40
	Simpson & Guy, plumbing, &c	42 75
	Tschiffley & Evans, medicines	5 75
	D. Baen Street, medical services	12 00
	C. A. Wells, medical services	56 00
	A. S. Johnson, miscellaneous	4 90
	W. E. Wood & Co., miscellaneous	13 00
	Pettit & Dripps, miscellaneous	3 40
	H. Adler, agent, miscellaneous	4 70
	Geo. N. Holland, miscellaneous	4 55
	Great Falls Ice Co., miscellaneous	8 00
	C. Denekas, miscellaneous	20 50
	J. N. Lauxman, miscellaneous	6 65
	Carl Mueller & Son, miscellaneous	27 90
	C. W. Thorne & Co., miscellaneous	15 26
	J. B. Olcott, hack-hire	12 00
	Geo. A. Shallenberger, pay-roll	906 33
	Peter Crowe, wages	30 00
	W. McDevitt, wages	12 00
Feb.	Geo. A. Shallenberger, sundries	38 93
	C. W. Brown, miscellaneous	46 70
	Hume, Cleary & Co., groceries	158 92
	Browning & Middleton, miscellaneous	239 33
	Geo. M. Oyster & Co., miscellaneous	74 00
	W. M. Galt & Co., flour	232 48
	Hume, Cleary & Co., meat	41 31
	G. F. Swift & Co., meat	156 38
	H. B. Kirkwood, meat	5 40
	W. R. Riley, dry goods	131 60
	A. Saks & Co., dry goods	46 15
	H. Adler, agent, dry goods	4 10
	C. W. Thorne & Co., dry goods	28 81
	W. L. King & Bro., leather	19 20
	Edwards & Castle, leather	88 65
	Washington Gas Light Co., gas	90 00
	L. H. Schneider & Son, hardware	16 95
	M. W. Beveridge, table ware	8 70
	Wm. Ballantyne & Son, stationery	21 18
	Geo. Ryneal, jr., paint	16 06
	Pennsylvania Construction Co., miscellaneous	352 50
	Washington Brick Machine Co., miscellaneous	13 25
	Paul Hiser & Son, miscellaneous	5 00
	Jos. J. Walton, miscellaneous	27 96
	J. B. Olcott, miscellaneous	15 00
	Auerbeck & Co., miscellaneous	26 50
	J. D. Free, jr., stationery	17 84
	Daniel Hannan, plumbing	16 75
	Thos. Brooks, wages	15 00
	Peter Crowe, wages	30 00
	Wm. McDevitt, wages	12 00
	Notley Anderson, fencing	185 50
	T. B. Cross, jr., fencing	90 81
	Notley Anderson, miscellaneous	42 95
	Norris Tasker & Co., miscellaneous	45 40
	G. A. Shallenberger, pay-roll	881 33
Mar.	G. A. Shallenberger, pay-roll	42 80
	Hume, Cleary & Co., groceries, &c	160 35
	Browning & Middleton, groceries, &c	175 94
	Geo. M. Oyster & Co., butter, &c	72 20
	W. M. Galt & Co., flour	211 95
	G. F. Swift & Co, meat	178 52
	Horace B. Kirkwood, oysters	9 00
	W. R. Riley, dry goods	69 94
	Woodward & Lothrop, dry goods	24 36

1884.		
Mar.	H. Adler, agent, dry goods	$19 28
	B. Robinson & Co., clothing	6 00
	A. Saks & Co., clothing	14 00
	Rob't Cohen, shoes	50 80
	Washington Gas Light Co., gas	64 80
	L. H. Schneider & Son, hardware	14 60
	M. W. Beveridge, tableware	5 50
	Geo. Watts, tableware	15 75
	Jno. A. Baker, farm implements	9 62
	Washington Brick Machine Co., manure	57 00
	Wm. Ballantyne & Co, stationery	4 94
	Gibson Bros., stationery	10 00
	Geo. Ryneal, jr., oils, &c	5 22
	Tschiffley & Evans, medicine	23 54
	E. N. Gray & Co., miscellaneous	38 01
	J. M. Lauxman, miscellaneous	8 55
	Geo. N. Holland, lime	4 20
	J. B. Olcott, miscellaneous	6 00
	G. A. Shallenberger, pay-roll	893 01
	Wesley Henson, miscellaneous	13 33
	G. A. Shallenberger, miscellaneous	32 50
Apr.	Hume, Cleary & Co., groceries	216 11
	Browning & Middleton, groceries	197 37
	Geo. M. Oyster & Co., butter	99 70
	W. M. Galt & Co., flour	234 93
	G. F. Swift & Co., beef	193 11
	Horace B. Kirkwood, oysters	15 53
	W. R. Riley, dry goods	67 67
	H. Adler, agent, dry goods	17 86
	A. Saks & Co., clothing	12 32
	A. M. Baer, caps	16 00
	Rob't Cohen, shoes	39 00
	Washington Gas Light Co., gas	65 70
	Johnson Bros., coal	15 00
	L. H. Schneider & Son, hardware	21 00
	Geo. Watts, tableware	8 90
	J. M. Lauxman, farm implements	5 40
	Washington Brick Machine Co., manure	30 00
	Wm. Ballantyne & Co., books	39 67
	J. D. Free, jr., stationery	7 18
	Geo. Ryneal, jr., painting	16 30
	Tschiffley & Evans, medicine	12 05
	Chas. A. Wells, M. D., medical attendance	48 00
	Lewis Barr, agent, miscellaneous	5 56
	Cornelius Moran, stock	200 00
	J. B. Olcott, hack hire	6 00
	Geo. A. Shallenberger, pay-roll	906 33
May.	Geo. A. Shallenberger, miscellaneous	42 10
	Hume, Cleary & Co., groceries	159 56
	Browning & Middleton, groceries	167 07
	Geo. M. Oyster & Co., groceries	76 20
	W. M. Galt & Co., flour	239 38
	G. F. Swift & Co., meat	199 10
	Woodward & Lothrop, dry goods	12 52
	H. Adler, agent, dry goods	35 58
	A. Saks & Co., dry goods	39 50
	A. M. Baer, dry goods	10 00
	Robert Cohen, leather	38 30
	Washington Gas Light Co., gas	31 80
	Johnson Bros., coal	29 00
	L. H. Schneider & Son, hardware	8 23
	M. W. Beveridge, tableware	20 67
	Peter Henderson & Co., seeds	51 36
	John A. Baker, seeds	57 56
	Bex & Hennsch, farm implements	40 00
	K. Kneessi, harness and repairs	15 83
	Washington Brick Machine Co., fertilizers	30 00
	Dan'l Hannan, plumbing	43 60
	Geo. Ryneal, jr., paint	15 00
	Tschiffley & Evans, medicine	17 60

1884.		
May.	J. M. Lauxman, miscellaneous	$4 20
	C. W. Brown, miscellaneous	22 75
	Geo. N. Holland, miscellaneous	7 00
	Thos. W. Smith, miscellaneous	7 00
	Geo. A. Shallenberger, pay-roll	863 83
	Geo. A. Shallenberger, miscellaneous	26 00
	E. R. Merry, stock	200 00
	Wash. B. Williams, furniture	97 37
	Wash. B. Williams, miscellaneous	34 00
	Browning & Middleton, groceries	133 32
	Hume, Cleary & Co , groceries	205 80
	Geo. M. Oyster & Co., groceries	92 07
	W. M. Galt & Co., flour	368 19
	G. F. Swift & Co., meat	285 52
	H. Adler, agent, dry goods	17 54
	Auerbach & Co., dry goods	5 00
	Eiseman Bros., dry goods	23 25
	Robt. Cohen, leather	36 80
	Edwards & Castle, leather	90 15
	Washington Gas Light Co., gas	31 35
	Geo. Watts & Son, hardware	5 33
	M. W. Beveridge, tableware	32 35
	Frank P. May & Co., tableware	21 32
	L. H. Schneider & Son, hardware	30 63
	Jno. A. Baker, seeds	19 30
	K. Kneessi, harness	7 25
	Washington Brick Machine Co., fertilizer	30 80
	J. D. Free, jr., stationery	14 30
	Geo. Ryneal, jr., painting,	6 75
	Dan'l Hannan, plumbing	66 75
	Tschiffley & Evans, medicine	5 95
	J. B. Olcott, hack hire	30 00
	J. B. Slack, stock	41 00
	Hood, Bonbright & Co., dry-goods	21 45
June.	G. A. Shallenberger, superintendent, pay-roll	866 33
	C. H. Garden & Co., dry-goods	23 04
	G. A. Shallenberger, sundries	41 61
	C. Denekas, groceries	20 24
	Hume, Cleary & Co., groceries	185 38
	Browning & Middleton, groceries	186 50
	Geo. M. Oyster & Co., groceries	88 52
	Thos. C. Jenkins, groceries	12 00
	W. H. Tenney, flour	133 75
	W. M. Galt & Co., flour	233 77
	G. F. Swift & Co., beef	193 80
	Hood, Bonbright & Co., dry-goods	107 45
	W. R. Riley, dry-goods	54 89
	A. Saks & Co., dry-goods	10 00
	Eiseman Bros., dry-goods	5 50
	H. Adler, agent, dry-goods	15 59
	Robert Cohen, leather	54 05
	W. L. King & Bro., leather	14 48
	Washington Gas Light Company, gas	22 05
	Johnson Bros., coal	43 50
	L. H. Schneider & Son, hardware	11 72
	F. P. May & Co., hardware	34 05
	Geo. Watts & Son, hardware	8 52
	M. W. Beveridge, hardware	68 13
	Bex & Hennsch, farm implements	43 85
	J. M. Lauxman, farm implements	5 50
	G. T. Dunlop, farm implements	2 50
	Browning & Middleton, seeds	9 00
	Jno. A. Baker, seeds	116 15
	K. Kneessi, harness and repairs	84 00
	Washington Brick Machine Company, fertilizer	29 60
	J. D. Free, jr., stationery	51 03
	E. Morrison, stationery	10 65
	C. W. Brown, stationery	8 75
	Wm. Ballantyne & Son, stationery	8 07
	Dan'l Hannan, plumbing	47 91

1884.			
June.	Robert Leitch & Son, plumbing	$56	50
	Samuel S. Shedd, plumbing	26	80
	Simpson & Guy, plumbing	28	65
	Thos. Somerville & Son, plumbing	2	60
	E. N. Gray & Co., plumbing	4	00
	Geo. Ryneal, jr., painting	50	79
	Chas. A. Wells, medical attendance	56	00
	Thos. S. Casper, stock	60	00
	Willett & Libbey, fencing	49	00
	Notley Anderson, fencing	52	16
	T. B. Cross, fencing	32	37
	C. W. Thorn & Co., miscellaneous	47	09
	W. B. Williams, miscellaneous	185	64
	J. B. Olcott, miscellaneous	24	00
	Geo. N. Holland, miscellaneous	8	75
	The Commissioners, D. C., miscellaneous	40	00
	D. Baen Street, M. D., miscellaneous	9	00
	Columbia Railroad Company, miscellaneous	156	52
	Tschiffley & Evans, miscellaneous	3	94
	E. B. Taylor, salary	31	25
	S. E. Decker, salary	30	00
	Peter Crowe, salary	30	00
	Isaiah Dean, salary	13	50
	Michael Hassett, salary	13	50
	Marianna Sadington, salary	12	00
	John Brown, salary	23	00
	Total	42,621	93

RECAPITULATION.

Amount received	42,640	79
Amount disbursed	42,620	93
Balance on hand	18	86

EXHIBIT S.—*Report of the warden of the jail.*

WARDEN'S OFFICE,
UNITED STATES JAIL,
Washington, D. C., November 1, 1884.

SIR: I have the honor to transmit herewith my annual report of the jail in the District of Columbia for the year which ended October 31, 1884.

Yours, very respectfully,

JOHN S. CROCKER,
Warden.

Hon. BENJAMIN H. BREWSTER,
Attorney-General United States.

WARDEN'S OFFICE, JAIL,
Washington, D. C., November 1, 1884.

SIR: The warden of the jail in the District of Columbia respectfully submits the following report for the year ended October 31, 1884:

It is gratifying to be able to state that notwithstanding an unusual number of murders have recently occurred in this District and impressed the public mind with serious apprehensions, the increase in the number of convictions for crime, as shown by the jail records, is hardly perceptible, and bears but little proportion to the apparent increase of the population.

During the year there were tried, convicted, and sentenced by the supreme court of the District of Columbia, holding criminal terms, to serve a term in the Erie County penitentiary, at Buffalo, N. Y., 10 males; to the State prison at Concord, N. H., 18 males; and to the Albany County penitenitary, at Albany, N. Y., 39 males and 5 females; a total number of 72 convicts, of whom 24 were white males, 43 were colored males, and 5 were colored females. During the preceding year the number so tried, convicted, and sentenced to the penitentiary was 91. During the year there were also tried, convicted, and sentenced by the courts of the District to serve a term in jail for various crimes and misdemeanors, 943, of whom 792 were males and 151 were females. During the preceding year the numbers so tried, convicted, and sentenced to jail was 851, of whom 701 were males and 150 were females. Also during the year just closed, 65 boys, of the number of those committed to jail, were tried, convicted, and sentenced to the Reform School in the District of Columbia. During the preceding year the number of boys so tried, convicted, and sentenced to the Reform School was 81.

During the year just closed the daily average number of prisoners in jail was 171. During the preceding year the daily average number was 178. The total number in jail during the year just closed was 1,969. During the preceding year the total number in jail was 1,898. Of those in jail during the year just closed 490 were white males, 1,190 were colored males, 16 were white females, and 273 were colored females. Of this number 120 males and 29 females were in jail at the beginning of the year; 1,560 males and 260 females were committed during the year. The total number above mentioned are accounted for as follows: There were pardoned by the President of the United States 3 white males, 3 colored males, and 1 colored female, and by the Commissioners of the District of Columbia 1 colored male. There were transferred to the Government Asylum for the Insane in the District of Columbia 3 white males; transported to the penitentiaries and prison heretofore mentioned 67 males and 5 females; transferred to the Reform School 65 males. Thirteen hundred and seventy-seven males and 255 females were discharged by due course of law and there remained in jail at the close of the year 190, viz: 61 white males, 100 colored males, 1 white female, and 28 colored females.

In obedience to duty, I transported to the penitentiaries and prison above mentioned the 72 convicts sentenced to those institutions respectively. The actual cost of transporting such convicts was $1,484.10, of which sum $679.52, being the railroad fare for the convicts from Washington, D. C., to the prison at Concord, N. H., and to the Albany County penitentiary at Albany, N. Y., was refunded to the warden by the superintendents of those institutions and duly accounted for by him to the Government. The warden also transferred from the jail to the Reform School hereinbefore mentioned, without any extra cost to the Government, 65 boys, 30 of whom were white and 35 colored.

Attention is again directed to the slate roof over the central part of the main building. This part of the roof never was water-proof, and, besides, two or three years after the building was completed, during a severe gale and storm in the winter, a heavy body of ice and snow, which had accumulated on the cupola, or lantern, as it is called, over the center of the building, broke loose from its lodgments and fell with a heavy crash on the roof, and damaged it to such an extent that it has since leaked very badly during storms, thereby flooding the rotunda or central apartment to an extent that causes great annoyance and in a measure interrupts the business of the institution for the time; but the more serious

results to be apprehended, if this condition of the roof should not be remedied very soon, are that the roof boards and timber supports will decay and cause the necessity of constructing an entire new roof over the part mentioned at a much greater cost than will be required to repair the present roof. The valley gutters around the eaves of the building are also in bad condition, and fail to answer the purposes for which they were constructed by reason of the damaged and broken condition of the copper lining to the same. On this account a portion of the water accumulating in the gutters from time to time, instead of being carried off, leaks down into the walls of the building and saturates them in several places, and unless remedied will eventually seriously damage and weaken the walls of the building, especially at the angles, where the leakage is greatest.

These matters were referred to in the last annual report of the warden, with a statement that the needed repairs, including the repairing of the cold air duct or turret on the north wing of the building, would require an expenditure of about $1,500. As no appropriation has been made for the purpose the repairs have not been made, and the necessity for them still exists. All other necessary repairs which were of minor consideration have been made from time to time as required, and the building and fixtures, with the exceptions above mentioned, are in good condition. The expenditures for repairs on the building, steam heating apparatus, laundry fixtures, and sewers were $449.92, and for paints, painting, and glazing $183.33.

The salaries of deputy warden, physician, engineer, guards, clerk, carpenter, assistant messenger, and cooks were $27,359.18. There was expended for the use of the jail the several sums and for the purposes mentioned below as follows:

Subsistence	$10,381 67
Fuel	3,283 82
Beds, bedding, and clothing	2,152 04
Gas and lights	595 10
Medicines, medical stores, and delicacies for the sick	419 60
Ice	207 47
Disinfectants, soap, sal-soda, lime, whitewash-brushes, and scrub-brushes	611 74
Stationery, blank books, and advertising	102 40
Keeping horse, cow, and repairs of harness and wagon	160 68
Furniture, including kitchen furniture, dishes, and utensils, cell furniture, and hard and tin ware, working and mechanical tools	753 50

The officers of the institution have performed their duties meritoriously. The prisoners committed to their charge have been humanely treated, and well supplied with good, nutritious food. A thorough system of sanitary measures has been adhered to. A good condition of health has been secured, and no death has occurred among the inmates during the year. Notwithstanding there has been an unusual number of very desperate characters in keeping, excellent discipline has been maintained and no serious disturbance has occurred. The sick have been carefully attended and faithfully treated by Alexander McWilliams, M. D., the jail physician, whose report, hereto annexed, treats more specially of sanitary matters, the treatment of the sick, their diseases, &c., and therefore reference to it is hereby respectfully made.

Religious meetings have been regularly and gratuitously held at the jail on Sundays, under the auspices of the Young Men's Christian Association of this city and the Colored Christian Association of the District. A commendable degree of interest has been manifested in these meetings by the prisoners, some of whom it is believed have been induced to reform and become honest and industrious citizens. The

ladies and gentlemen who have conducted the meetings have been earnest and faithful in the work, and are entitled to the gratitude of all good citizens who desire the reformation of the abandoned and criminal classes.

The small-pox hospital of the District is located on the jail grounds, but is in charge of the District authorities. It is within a few hundred feet of the jail building, and from time to time, by its close proximity and the presence of the small-pox therein, causes much anxiety and serious apprehensions on the part of the inmates of the jail by the danger of transmitting to them that dreaded disease. On two or three occasions the disease has heretofore been communicated from the hospital to jail inmates, producing several cases of the disease, three of which were fatal, besides causing general alarm and interrupting the proceedings of the courts. It is believed that the District authorities would gladly remove the hospital to a more appropriate place if they were provided with means for the purpose. It is to be hoped that an appropriation to secure the desired object may be obtained at an early day.

Those who were committed to jail during the year were charged with crimes classified as follows, viz:

Offenses charged.	White males.	Colored males.	White females.	Colored females.	Total.
Murder	5	10		1	16
Manslaughter		2			2
Assault intent to kill	10	34		1	45
Arson		2			2
Rape	1	13			14
Attempt to commit rape	1				1
Robbery	2	8			10
Housebreaking	30	54		2	86
Burglary		4			4
Grand larceny	33	32	2	21	88
Forgery	7	6			13
False pretense	5	1		1	7
Perjury		3			3
Receiving stolen goods	3	13	1		17
Larceny from person	10	12			22
Embezzlement	1	2			3
Petit larceny	128	357	6	125	616
Attempt to pick pocket	2	1			3
Violating postal laws	2				2
Making false claim	1				1
Bigamy	2	2			4
Resisting Metropolitan police officers	3	2			5
Keeping gambling-house	3	5			8
Policy business	1	12			13
Assault and battery	86	334	3	57	480
Assault	19	80		16	115
Affray	9	24		9	42
Sodomy		5			5
Trespass	3	8			11
Keeping bawdy-house	1	1		5	7
Keeping disorderly house		1		1	2
Disorderly assembly	1				1
Robbing graves	3	6			9
Mayhem		1			1
Threats of violence	25	17	1	1	44
Refusing to do seamen's duty	4				4
Disorderly				1	1
Bench warrant	33	20		1	54
Contempt of court		5		3	8
Incorrigibility	4	16			20
Vagrancy	10	6			16
Keeping vicious dog	1				1
Failing to pay dog tax		4			4
Cruelty to animals	1				1
Immoral practices				1	1
United States witnesses	2	5		1	8

Of the number of those who were committed to jail as above stated, 72 were tried, convicted, and sentenced to the State prison and penitentiaries hereinbefore mentioned for crimes which are classified as follows:

Crimes.	White males.	Colored males.	White females.	Colored females.	Total.
Murder	.....	1	.....	.....	1
Assault intent to kill	1	1	.....	.....	2
Arson	1	.....	.....	.....	1
Robbery	2	1	.....	.....	3
Housebreaking	2	21	.....	.....	23
Grand larceny	7	3	.....	3	13
Receiving stolen goods	.....	1	.....	.....	1
Burglary and larceny	1	.....	.....	.....	1
Larceny from person	.....	4	.....	.....	4
False pretense	4	1	.....	.....	5
Second offense petit larceny	1	7	.....	2	10
Forgery	2	.....	.....	.....	2
Attempt to commit rape	.....	1	.....	.....	1
Horse-stealing	2	.....	.....	.....	2
Resisting Metropolitan police officer	.....	1	.....	.....	1
Mayhem	.....	1	.....	.....	1
Violating postal laws	1	.....	.....	.....	1

As before stated, 65 boys, who were of those committed to jail, were tried, convicted, and sentenced to the Reform School. Their crimes and offenses are classified as follows, viz:

Crimes.	White.	Colored.	Total.
Manslaughter	.....	1	1
Forgery	.....	1	1
Arson	.....	1	1
Housebreaking	2	5	7
Petit larceny	10	11	21
Sodomy	.....	1	1
Assault	.....	1	1
Incorrigibility	7	9	16
Vagrancy	10	5	15
Disorderly assembly	1	.....	1

Also, of those committed as before stated, 943 were sentenced to serve terms in jail for crimes and offenses which are classified as follows, viz:

Crimes.	White males.	Colored males.	White females.	Colored females.	Total.
Manslaughter	.....	1	.....	.....	1
Housebreaking	1	5	.....	1	7
Embezzlement	3	2	.....	.....	5
False pretense	3	.....	.....	.....	3
Receiving stolen goods	1	2	1	.....	4
Petit larceny	68	210	3	72	353
Larceny from person	.....	1	.....	.....	1
Violating pension laws	1	.....	.....	.....	1
Violating postal laws	1	.....	.....	.....	1
Policy business	.....	1	.....	.....	1
Keeping gambling-house	3	6	.....	.....	9
Assaulting Metropolitan police officer	4	1	.....	.....	5
Assault and battery	64	315	2	52	433
Affray	10	18	.....	7	35
Threats of violence	21	9	1	1	32
Attempt to pick pocket	1	.....	.....	.....	1
Attempt to commit larceny	.....	2	.....	.....	2
Sodomy	.....	2	.....	.....	2
Trespass	3	6	.....	.....	9
Assault	3	7	.....	1	11
Robbing graves	1	2	.....	.....	3
Keeping bawdy-house	1	3	.....	4	8
Immoral practices	.....	.....	.....	1	1
Contempt of court	.....	5	.....	3	8
Keeping vicious dog	1	.....	.....	.....	1
Disorderly conduct	.....	.....	.....	2	2
Failing to pay dog-tax	.....	4	.....	.....	4

Very respectfully, your obedient servant,

JOHN S. CROCKER,
Warden.

Hon. BENJAMIN H. BREWSTER,
Attorney-General United States.

WASHINGTON, D. C., *November* 1, 1884.

DEAR SIR: I regret to state that during the latter part of the summer and fall we have had an unusual amount of sickness to contend with at the jail. Fever of intermittent and remittent form has been very prevalent, also dysentery and protracted cases of diarrhœa, some of a most obstinate character. But up to the present time we have, fortunately, had no deaths to record. The nursing and general care of the sick, considering our limited facilities, have been admirably conducted, and the suitable diet of the best kind furnished in abundance. Fewer cases of mania from drinking have been reported this year than usual, and not a single case of opium habit has been brought to my notice. Two of the prisoners during the past year became insane, and by order of the Attorney-General were sent to the Government Asylum for the Insane for treatment. The female department, considering the bad construction of its cells, has been comparatively free from the prevailing forms of disease that have visited the main body of the prison. The many cases reporting are the result of the depraved mode of life before entering the prison. Many leave only to return in a much worse condition. The cleanliness and care of the prisoners are all that can be desired. The food is well cooked, of the best quality, in abundance, varied, and daily inspected by the medical officer. I have again to thank you for your uniform courtesy, kindness, and the assistance which I have always received.

Most truly, yours,

A. MCWILLIAMS,
Physician United States Jail.

General JOHN S. CROCKER,
Warden United States Jail.

EXHIBIT T.

UNITED STATES MARSHAL'S OFFICE, UTAH TERRITORY,
Salt Lake City, November 13, 1884.

SIR: Replying to your letters of September 24 and October 7, I have the honor to state that there are now confined in the Utah penitentiary 99 prisoners, some few of whom are waiting trial, and many are under sentence to long terms of imprisonment.

In the month of April, 1882, when I took charge of the penitentiary, I found the average number of prisoners to be from 45 to 50; the monthly average now is about 100. I can see no reason why the increase for the next two years shall not be as great, if not greater, than that of the two last past. This will certainly be the case if offenders against the United States laws here are brought to justice, as there now seems a reasonable prospect.

The penitentiary is built on a Government reservation about 4½ miles southeast from this city, in a dry, healthy place, with a plenty of pure well and creek water. The wall is 22 feet high and 4 feet thick, of adobe or mud brick, which is so soft that a man with a carving-knife, if left to himself, could work his way through in a very short time. This wall incloses 1 acre of ground. Inside this inclosure there is a building 50 by 20 feet, built of lumber, and used as a sleeping-room for the prisoners. We have now about as many bunks, three high and two men in each, as can be arranged for.

With this great number of men in so small a space the air is necessarily bad, and, in my judgment, will, in the course of time, seriously affect the health of the prisoners.

There is a frame building used for a dining or living room. The dimensions I have not at hand. With the late extension authorized by the Department, it is now quite comfortable. There is one cell for solitary confinement, also built of wood.

With this description it can be readily seen that it is the vigilance of the guards alone that keeps our prisoners.

Regarding the necessity for a new penitentiary, I have to say that the present one is inadequate and insecure in every particular. With an increase for the two next ensuing years in the ratio of the last two, it will be, with our present accommodations, impossible to keep them.

Building rock can be had in the cañon near by, the labor can be done by the prisoners, and sufficient land inclosed to make room for workshops, which in the future might greatly reduce the cost of support of prisoners, &c.

As to the probable cost of a new penitentiary suitable for the wants of this Territory, in the absence of any plans, &c., I am unable to give any definite figures. I have talked with builders, stone-masons, &c., who, of course, are not familiar with the necessities for the interior; they make estimates of from $75,000 to $100,000.

I have to beg indulgence for delay in replying to your letters in this matter, which has been caused by the great amount of United States business in the court requiring my personal attention.

I am, sir, very respectfully, your obedient servant,

E. A. IRELAND,
United States Marshal and Warden.

Hon. B. H. BREWSTER,
Attorney-General.

EXHIBIT U.

TERRITORY OF MONTANA,
EXECUTIVE DEPARTMENT,
Helena, September 25, 1884.

SIR: I have the honor to call your attention to the following estimate for completing the United States penitentiary at Deer Lodge, and I would most respectfully request that you present the same in your annual estimates to Congress:

For completing entire building according to original plans, including walls and outbuildings, $80,000. This estimate has been carefully compiled by the best and most experienced architects and builders in the Territory, whom I sent to Deer Lodge to make an examination according to the original plans and specifications. Much of the brick-work in the present wing is in bad condition, forbidding the erection of a third tier of cells, as originally proposed.

The Department has been thoroughly advised, from time to time, of the necessity for increased accommodations, which grows even more and more imperative every day.

Very respectfully,

JNO. SCHUYLER CROSBY,
Governor of Montana.

Hon. B. H. BREWSTER,
Attorney-General.

OFFICE OF UNITED STATES MARSHAL,
DISTRICT OF MONTANA,
Helena, Mont., October 2, 1884.

SIR: I have the honor to acknowledge the receipt of your favor of the 24th ultimo (W. H.). The appropriation made at the last session of Congress for the improvement of the United States penitentiary at Deer Lodge is expended under the superintendence of Governor Crosby. Upon applying to him for the information desired, he advised me that he had forwarded estimates to you.

There are now confined in the penitentiary 116 convicts. Of these 56 are confined in the twenty-eight cells in the stone wing. The remainder are crowded into insecure and unwholesome log buildings within the yard. During the fall terms of court, now in progress, there will be not less than 30 additional prisoners sentenced to the penitentiary. It will be practically impossible to receive them. While I am not advised how the recent appropriation of $15,000 is to be expended, it is scarcely possible that it will complete any part of the building "in accordance with the original plans" so as to afford additional accommodations. For the amount necessary for that purpose you are respectfully referred to the estimates forwarded by Governor Crosby, of which mention has been made above.

Very respectfully,

ALEX. C. BOTKIN,
United States Marshal.

Hon. S. F. PHILLIPS,
Acting Attorney-General.

EXHIBIT V.—*Letter of the First Comptroller.*

TREASURY DEPARTMENT,
FIRST COMPTROLLER'S OFFICE,
Washington, D. C., November 1, 188?.

SIR: The adjustment of emolument accounts of district attorneys, clerks, and marshals would be facilitated if they could be settled by fiscal years, as other accounts are settled. It is therefore respectfully suggested that you will please recommend to Congress, at its next session, that section 843 of the Revised Statutes be amended by striking out the word "calendar" and inserting in its place the word "fiscal."

Very respectfully,

WM. LAWRENCE,
Comptroller.

Hon. BENJAMIN HARRIS BEWSTER,
Attorney-General.

EXHIBIT W.

COURT OF COMMISSIONERS OF ALABAMA CLAIMS,
Washington, November 14, 1884.

SIR: I have the honor to submit herein my second report as counsel on behalf of the United States before the Court of Commissioners of Alabama Claims.

As stated in my former report, the total number of claims filed within six months from the organization of the court, that is to say, at or before 12 m. of the 14th day of January, 1883, is as follows:

	Number of claims.	Amount.
Class I	1,591	$10,520,503 01
Class II	4,160	17,541,493 89
Total	5,751	28,061,996 90

The cases tried, dismissed on demurrer, or otherwise finally disposed of, up to July 23, 1884, are, of—

	Number of claims.	Amount claimed.	Amount allowed.
Class I	891	$7,083,250 96	$1,890,179 54
Class II	1,118	4,469,854 71	3,505,697 61

To be disposed of on July 23, 1884, cases as follows, of—

	Number of claims.	Amount.
Class I	700	$3,437,252 05
Class II	3,042	13,071,639 18
Total	3,742	16,508,891 23

Of the cases of the first class tried and disposed of, there have been duly certified and reported to the Secretary of State, under the provisions of the third section of the act entitled "An act to extend the duration of the Court of Commissioners of Alabama Claims, and for other purposes," approved June 3, 1884, the following:

Judgments in cases for claimants	642
Judgments in cases for United States	197
Amounting, for principal, to	$1,844,477 81
Amounting, for interest, to	1,023,854 26
Total	2,868,332 07

In a number of the cases so reported there were two or more claimants with distinct interests, in whose behalf separate judgments were entered, thus increasing the total number of judgments reported to 1,191, all included, however, in the amounts of principal and interest above given.

Since the 23d of July last, the court, when in session, has given precedence to cases of the first class, and has urged them to final adjudication with all possible dispatch. The cases tried and dismissed since the reassembling after the summer vacation are, of—

	Number of claims.	Amount.
Class I	178	$791,699 45
Class II	3	12,388 00
Total	181	804,087 45

Thirty cases of Class I and 3 cases of Class II of the above were dismissed, the amount claimed therein being $480,615.88; and 142 cases of Class I in which judgments have been entered, showing the following results: 172 cases of Class I finally disposed of by judgments and dismissed, in which $55,403.20 only were allowed, although $603,526.95 were claimed.

There still remain unacted upon—

	Number of claims.	Amount of claim.
Class I	522	$2,645,552 60
Class II	3,039	13,059,251 18
Total	3,561	15,704,803 78

All of which will be brought to trial without delay. It is believed that many of them will be dismissed under demurrer or for want of due prosecution

With the highest respect, your obedient servant,

JNO. A. J. CRESWELL,
Counsel on behalf of the United States.

Hon. BENJ. H. BREWSTER,
Attorney-General of the United States.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. Doc. No. 13.

SUSPENDED ENTRIES OF PUBLIC LANDS.

LETTER

FROM

THE SECRETARY OF THE INTERIOR,

TRANSMITTING

List of suspended entries of public lands acted on by the Commissioner of the General Land Office in the year ending June 30, 1884.

DECEMBER 4, 1884.—Referred to the Committee on the Public Lands and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, December 3, 1884.

SIR: Pursuant to the requirement of section 2452, Revised Statutes, I have the honor to transmit herewith a list, prepared by the Commissioner of the General Land Office, of suspended entries of public lands acted on, during the year ending 30th June last, by the Board provided for in section 2450, Revised Statutes.

Very respectfully,

H. M. TELLER,
Secretary.

The Hon the SPEAKER
OF THE HOUSE OF REPRESENTATIVES.

Public land cases confirmed by the Board of Adjudication during the year ending June 30, 1884.

[Abstract of suspended cases adjudicated by the Commissioner of the General Land Office, and his adjudication submitted for the approval and confirmation by the Secretary of the Interior and Attorney-General, under sections 2450 and 2457, United States Revised Statutes, and act of February 27, 1877.]

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of sections.	Section.	Township	Range.	Cause of suspension.	Reason assigned for failure.
1	Huntsville, Ala.....	Homestead .	24	1898	Elisha H. Nix.....	SW. ¼ of SW. ¼.....	29	12	11	Proof not made in time	Ignorance.
						SE. ¼ of SE. ¼	30	.....	.....		
2	....do	....do	24	1703	John B. Chasteen...	NE. ¼ of SW. ¼	32	8	7	.....do	Do.
3	....do	....do	24	1854	Riley Mattox	W. ½ of NE. ¼	28	9	11	.....do	Do.
4	Montgomery, Ala ...	....do	24	1861	Jonathan D. Stephens.	W. ½ of SE. ¼ and E. ½ of SW. ¼.	29	13	11	.....do	Do.
5	....do	....do	24	1749	Samuel Crabtree....	N. ½ of NE. ¼	13	3	3	.....do	Do.
6	Gainesville, Fla.....	....do	24	3093	Harriet Walker.....	S. ½ of NW. ¼.....	15	4	27	.....do	Poverty.
7	... do	....do	24	3391	Andrew B. Burton..	NW. ¼ of SE. ¼ and NE. ¼ of SW. ¼.	32	14	20	.....do	Negligence.
8	....do	....do	24	3306	Ruth K. Scruggs....	Lot No. 1	36	2	26	.....do	Ignorance.
9	....do	....do	24	3483	Stephen Chance.....	W. ½ of NW. ¼	8	4	13	.....do	Sickness.
10	....do	....do	25	3459	Margaret A. Redbrook.	SE. ¼ of SW. ¼	28	28	19	Residence not established in time.	Poverty.
						And NE. ¼ of NW. ¼.....	33	.....	.....		
11	....do	....do	25	3154	John A. Mohr	N. ½ of NE. ¼ and SE. ¼ of NE. ¼.	5	23	28	.....do	Do.
						And NW. ¼ of NW. ¼.....	4	.....	.....		
12	....do	... do	25	1987	Philip J. Baker...	E. ½ of NE. ¼	31	60	40	.....do	Negligence.
						NW. ¼ of NW. ¼	32	.....	.....		
						And SW. ¼ of SW. ¼	29	.....	.....		
13	....do	....do	25	3484	Robb D. McDonald	SE. ¼ of SW. ¼ and SW. ¼ of SE. ¼.	8	14	24	.....do	Ignorance.
						And NE. ¼ of NW. ¼ and NW. ¼ of NE. ¼.	17	.....	.....		
14	....do	Warrant	13	48358	McDavid & Byrne ..	S. ½ of NW. ¼, and NW. ¼ of NW. ¼, and NE. ¼ of SW. ¼.	28	4	30	Land not restored after having been released from railroad grant.	
15	Marquette, Mich....	Homestead .	25	484	Joseph Porter	NE. ¼	25	45	1	Residence not established in time.	No road.
16	Reed City, Mich	....do	25	5079	Nelson Bennett	SW. ¼.....	13	37	5	.....do	Sickness.
17	....do	....do	25	5073	Moses S. Weaver ...	SW. ¼	25	36	5	.....do	Negligence.
18	Marquette, Mich....	....do	24	391	William Miller.....	S. ½ of SW. ¼	10	47	24	Proof not made in time	Ignorance.
19	....do	... do	24	387	C. Moffette	SE. ¼ of SW. ¼ and SW. ¼ of SE. ¼.	2	46	24	..... do	Poverty.
20	Worthington, Minn	....do	24	6494	Ignatz Habermann .	S. ½ of SE. ¼	18	104	38	.....do	Ignorance.
21	....do	....do	24	6553	Patrick McGithgan.	NW. ¼ of NW¼.....	4	104	4	.....do	Do.
22	Niobrara, Nebr	....do	24	3271	Albert Tichy	NW. ¼	3	31	6	.....do	Do.

23	Grand Island, Nebr.	....do	25	6342	Gilbert O'Brien.....	S. ½ of SE. ¼ and S. ½ of SW. ¼.	26	21	18	Residence not established in time.	Sickness.
24	Menasha, Wis	....do	25	1360	George D. Loomis...	SE. ¼	32	29	12	.....do.....	Do.
25	Natchitoches, La ..	....do	25	1145	William McDonald .	SE. ¼.....	1	22	13	.....do.....	Ignorance.
26	Gainesville, Fla	....do	24	3171	Nancy Moses	SE. ¼ of SE. ¼	33	2	14	Proof not made in time.....	Do.
27	....do	....do	24	5767	James Norton	Lots 2 and 5	12	3	10	..... do.....	Do.
28	.. do	....do	24	3207	Washington Brooks.	W. ½ of SE. ¼	18	1	12	.....do.....	Do.
29	... do	....do	24	2911	Prince Stewart	NW. ¼ of SW. ¼ and SW. ¼ of NW. ¼.	28	1	13	..... do.....	Do.
30	....do	....do	24	3196	Isaac Gillard	NW. ¼ of SW. ¼ and SW. ¼ of NW. ¼.	17	15	20	.....do.....	Do.
31	....do	....do	24	3195	Pernell Blackman ..	SE. ¼ of SE. ¼	17	15	20	.... do.....	Do.
32	... do	....do	24	3226	Heirs of T. J. Weathersbee.	Lots 1, 2, 3, and 4	4	11	26	.....do.....	Do.
33	....do	....do	24	3224	Thomas Banskett ..	S. ½ of NE. ¼.....	34	15	21	Conflict with prior homestead entry No. 418 canceled March 21, 1876.	
34	....do	....do	19	2463	Joseph Fleming.....	SW. ¼ of NW. ¼	32	3	16	Proof not made in time.....	Do.
35	Saint Cloud, Minn ..	....do	24	6965	Lawrence Calwell...	N. ½ of NE. ¼	34	34	28	.....do.....	Do.
36	Worthington, Minn.	....do	24	6493	Godfred Habermann	N. ½ of SE. ¼.....	18	104	38	..... do.....	Do.
37	Litchfield, Minn	... do	24	5550	Carl Anderson....	E. ½ of NE. ¼ ..... And W. ½ of NW. ¼.....	20 21	122	46	Proof not made in time, and residence not established in time.	
38	Alexandria, Minn...	....do	24	2252	August Johansen...	E. ½ of NE. ¼	30	134	44	Do.	
39	Benson, Minn.....	....do	25	10205	James W. McCoon..	SW. ¼	14	124	45	.....do.....	No building material.
40	Reed City, Mich	....do	24	4879	Dominick Gallagher	E. ½ of NE. ¼ and E. ½ of SE. ¼.	22	38	10	Proof not mad in time.....	Delay in mail.
41	....do.	....do	24	4884	Hugh Boyle	N. ½ of NW. ¼ ..... And N. ½ of NE. ¼....	26 27	38	10	Proof not made in time.....	Ignorance.
42	Marquette, Mich....	....do	19	398	Archie McDonald...	W. ½ of SE. ¼ and E. ½ of SW. ¼.	13	39	19	Land not restored to market, it having been canal land.	
43	Salt Lake City, Mich	....do	24	2287	Robert Michie .	NW. ¼ of SW. ¼..... NE. ¼ of SE. ¼ and SE. ¼ of NE. ¼.	12 11	3	6	Proof not made in time.....	Do.
44	Camden, Ark	....do	24	5666	Peter McCleadon .	NE. ¼ of SE. ¼ and S. ½ of SE. ¼. And NE. ¼ of NE. ¼	5 8	18	23	do.....	Sickness.
45	Little Rock, Ark ...	....do	24	3335	James Butter.....	N. ½ of NW. ¼ ..... And E. ½ of NE. ¼	36 35	10	6	....do..... ..	Ignorance.
46	Eureka, Nev	....do	24	57	John Collins	W. ½ of NE. ¼ and SE. ¼ of NE. ¼.	18	12	56	.....do.....	Do.
47	....do	....do	24	63	Claus Schoer	N. ½ of SE. ¼	18	36	62	.....do.....	Do.
48	Carson City, Nev ..	....do	24	144	Joseph Brown	E. ½ of SW. ¼ and W. ½ of SE. ¼.	25	19	28	.....do.....	Do.
49	Larned, Kans	....do	25	1773	George Barley	NW. ¼	14	21	21	Residence not established in time.	Horse crippled.
50	Oberlin, Kans	....do	Special.	183	F. M. Brummett.....	NE. ¼	13	2	29	See Commissioner's letter with the papers in the case.	
51	Gainesville, Fla	....do	24	3524	Joseph Timmons....	NE. ¼ of NW. ¼	8	2	13	Proof not made in time	Sickness.

Public land cases confirmed by the Board of Adjudication during the year ending June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
52	Gainesville, Fla....	Homestead	24	3446	John W. Hart.....	E. ½ of NW. ¼, SW. ¼ of NW. ¼, and NW. ¼ of SW. ¼.	10	23	30	Proof not made in time	Ignorance.
53	....do	... do	24	3518	Allen Geiger.....	NE. ¼ of NE. ¼	22	7	21	.....do.....	Do.
54	....do	.. do	24	3672	B. Lipscomb	N. ½ of SE. ¼	5	15	21	.... do	Do.
55	....do	....do	25	3663	S. W. Skinner.....	S. ½ of NW. ¼, SW. ¼ of NE. ¼, and NW. ¼ of SE. ¼.	2	20	27	Residence not established in time.	Sickness.
56	....do	....do	25	3525	Wm. A. Simmons ...	E. ½ of NE. ¼	30	22	31	.....do.....	Ignorance.
57	... do	... do	25	2999	Martha A. Hall	Lot 6	18	10	25	.....do.....	House not built in time.
58	....do	....do	25	2988	Wm. H. Williams ...	NE. ¼ of NE. ¼	21	29	15	.....do.....	Do.
59	....do	....do	25	3436	Adna C. Spencer	Lots 2 and 3 .... And S. ½ of NW. ¼	24 19	17 17	33 34	....do.....	Sickness.
60	Stockton, Cal.....	....do	24	1398	Paul Bacigalupi ..	E. ½ of SE. ¼ ..... NE. ¼ of NE. ¼ ..... And NW. ¼ of NW. ¼	4 9 10	... 2	..... 13	Proof not made in time....	Ignorance.
61	....do	....do	24	1383	Andrew J. Beardslee	E. ½ of NE. ¼ and E. ½ of SE. ¼.	35	2	11	.....do	Sickness.
62	... do	....do	24	1372	James P. Lunt.....	NE. ¼ of NE. ¼	22	1	14	.....do.....	Ignorance.
63	....do	... do	24	1369	Mary M. Mendenhall.	NE. ¼	25	1	6	.....do.....	Do.
64	....do	....do	24	908	Thomas M. Clothier.	NE. ¼	10	2	11	.....do	Do.
65	Sacramento, Cal	....do	24	1729	Richard A. Overton	Lot 1 of NE. ¼..... And lots 1, 2, and 3 of SE. ¼.	2 35	5 6	12 12	....do.....	Do.
66	....do	....do	24	1725	Samuel P. Colburn..	NE. ¼ of NW. ¼	24	11	10	.....do.....	Do.
67	Eau Claire, Wis	....do	24	2881	James Cator	SE. ¼ of NE. ¼.....	34	32	1	..... do.....	Do.
68	....do	.. do	24	2875	Charles B. Powell ..	S. ½ of SE. ¼	20	31	1	... do.....	Do.
69	....do	....do	24	2873	Narcisse Marion ..	S. ½ of SE. ¼.....	24	30	1	.....do.....	Severe storms.
70	Montgomery, Ala ...	....do	24	1372	John E. Fair.....	W. ½ of SE. ¼ and SE. ¼ of SE. ¼	14	20	10	.....do.....	Negligence.
71	Huntsville, Ala	....do	24	1734	Henry W. McCollom	S. ½ of SW. ¼, 3, and N. ½ of NW. ¼.	10	14	11	.....do.....	Ignorance.
72	Jackson, Miss.....	....do	24	3097	J. W. Sims	E. ½ of SW. ¼ and S. ½ of SE. ¼.	21	14	9	.....do	Do.
73	....do	....do	24	5855	Susan Nelson	E. ½ of NE. ¼	18	1	4	.....do.....	Do.
74	Harrison, Ark	....do	24	1045	William J. Bobs ..	SE. f'l ½ of SE. f'l ¼..... And N. f'l ½ of NE. f'l ¼ ..	12 13	18	23	....do.....	Sickness.
75	Tracy, Minn	.. do	24	4793	Hems Phorsen	Lot 1	32	108	30	.....lo.....	Ignorance.
76	Huntsville, Ala	....do	24	1877	Henry Burke	E. ½, NW. ¼	33	5	7	.....do	Do.
77	... do	....do	24	1749	Wm. W. Cameron..	SE. ¼.....	30	5	8	.....do.....	Do.

78	....do	....do	24	1723	William Moses	E. ½ of NE. ¼	24	7	13	.....do	Do.
79	....do	....do	24	1750	A. Haywood	NE. ¼ of SW. ¼ and W. ½ of SE. ¼, NE. ¼ of SE. ¼.	6	14	6	.....do	Do.
80	....do	....do	24	1768	Robert F. Ezzell	NW. ¼ of SW. ¼ and S. ½ of SW. ¼.	12	7	13	.....do	Do.
81	Montgomery, Ala	....do	24	4568	James T. Largin	E. ½ of NW. ¼	8	22	7	.....do	Do.
82	Huntsville, Ala	....do	24	1982	John Oliver	N. ½ of NE. ¼	24	9	7	.....do	Do.
83	....do	....do	24	2605	Nancy Harbin	SW. ¼ of SW. ¼ and N. ½ of SW. ¼, and SW. ¼ of NW. ¼	32	12	11	.....do	Do.
84	....do	....do	24, 25	4342	Robert Crumpton	NW. ¼	1	9	8	Proof not made in time and residence not established in time.	Sickness.
85	....do	....do	19	1711	Geo. H. Robinson	SW. ¼ of SE. ¼ and SE. ¼ of SW. ¼, NE. ¼ of NW. ¼.	9	14	6	Conflict with Home No. 1331 for the E. ½ of NW. ¼ sec. 9, which was canceled April 5, 1883.	
86	Gainesville, Fla	....do	24	2958	Michael Jones	N. ½ of NE. ¼	18	10	18	Proof not made in time	Ignorance.
87	....do	....do	24	5186	Hampton Whaley	NW. ¼ of NW. ¼	36	2	5	.....do	Sickness.
88	....do	....do	24	1134	John W. Krinimger	N. ½ of NW. ¼	5	6	13	.... do	Ignorance.
89	.. do	.. do	24	3677	Jefferson Smith	E. ½ of SW. ¼	4	11	23	.....do	Do.
90	... do	....do	24	3688	Mitchell Hill	N. ½ of lots 4 and 5 and E. ½ of lot 6.	30	7	20	.... do	Do.
91	....do	....do	25	3697	Heirs of Ann M. Pitt.	NE. ¼	4	19	28	Residence not established in time.	No material to build in time.
92	....do	....do	25	3684	Henry J. Hicks	W. ½ of NE. ¼ S. ½ of NW. ¼	4	18	23	.... do	Poverty.
93	Benson, Minn	....do	25	7414	Ols Keren	E. ½ of SW. ¼	26	117	43	.... do	Do.
94	Fergus Falls, Minn	....do	25	3548	John A. Timble	SE. ¼	6	125	46	.....do	Do.
95	Tracy, Minn	....do	25	4845	John Johnson	S. ½ of SE. ¼	34	107	38	.....do	Do.
96	.. do	.. do	24	4847	Gustaf Rask	SE. ¼	8	110	43	Proof not made in time	Negligence.
97	Marquette, Mich	do	24	455	Andrew Khiber	NW. ¼ of SE. ¼, N. ½ of SW. ¼, and SW. ¼ of NW. ¼.	26	44	24	.....do	Ignorance.
98	Reed City, Mich	....do	24	5037	John D. Rockwell	S. ½ of NE. ¼	24	16	6	.....do	Do.
99	Wichita, Kans	....do	25	5124	David W. Hall	SE. ¼	34	24	9	Residence not established in time and proof not made in time.	Sickness.
100	Grand Island, Nebr.	....do	25	6999	Andrew J. Krokstrom.	SE. ¼	26	20	5	Residence not established in time.	Do.
101	Montgomery, Ala	....do	24	1791	Martin L. Wood	E. ½ of NW. ¼	4	16	4	Proof not made in time	Ignorance.
102	.. do	....do	24	2246	George W. Richards	SE. ¼ of NE. ¼ and E. ½ of SE. ¼.	7	15	5	....do	
						And NE. ¼ of NE. ¼	18	.....	.....		
103	....do	....do	24	2259	Wiley A. Hagler	S. ½ of NE. ¼	34	17	9	.....do	
104	....do	....do	24	2262	John L. Glover	E. ½ of NE. ¼ and SW. ¼ of NE. ¼.	10	16	5	.....do	
105	....do	....do	24	2402	John D. Carmichael	SW. ¼ of NE. ¼	34	21	6	.....do	
106	....do	....do	24	2403	Thomas P. Featherston.	NE. ¼ of SE. ¼	33	21	6	.....do	
107	....do	....do	24	2404	Thomas G. Hammond.	SW. ¼ of SE. ¼	28	21	6	.....do	
108	....do	... do	24	2229	Frank Burford	SE. ¼ of NE. ¼	26	18	3	.....do	
109	....do	....do	24	2225	Robt. A. Cumming	E. ½ of NE. ¼ and N. ½ of SE. ¼.	20	15	5	.....do	

Public land cases confirmed by the Board of Adjudication during the year ending June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
110	Montgomery, Ala...	Homestead .	24	2111	John J. Gilbert....	SE. ¼ of SW. ¼ and SW. ¼ of SE. ¼.	35	17	8	Proof not made in time	
						And W. ½ of NE. ¼	2	18	8		
111	....do	....do	24	2062	Miles P. Williams ..	SW. ¼ of NW. ¼	18	9	19	.....do	
112	....do	....do	24	2040	Ralph Garner ..	E. ½ of NW. ¼	1	3	3	.....do	
113	... do	...do	24	2031	Benjamin Perry	SW. ¼ of NE. ¼ and SE. ¼ of NW. ¼.	25	12	10	.....do	
114	....do	....do	24	2008	Elis Crowley	NW. ¼ of SE. ¼ and NE. ¼ of SW. ¼.	34	11	23	.....do	
115	....do	....do	24, 25	2268	Samuel H. Williams	SE. ¼ of SE. ¼	11	.....	.....	Proof not made in time and residence not established in time.	
						E. ½ of NE. ¼	14	15	7		
						NW. ¼ of NW. ¼	13	.....	.....		
116	Huntsville, Ala.....	....do	24	5398	Sibba A. Cantrell...	SW. ¼ of NE. ¼ and NW. ¼ of SE. ¼.	19	11	14	Proof not made in time.....	
117	... do	...do	24	1744	John R. McCurry...	E. ½ of NE. ¼	26	14	2	.....do	
118	... do	....do	24	2583	William M. Gibson .	SE. ¼ of NE. ¼	8	10	2	.... do	
119	....do	....do	24	2561	Mary J. Sledge ...	SW. ¼ of SW. ¼	36	1	8	.....do	
120	....do	....do	24	2174	Washington Mation	N. ½ of NE. ¼	12	11	1	.....do	
121	Marquette, Mich	....do	24	478	James Kindlow	W. ½ of NE. ¼	2	46	25	.....do	
122	Reed City, Mich	....do	24	5231	John Jones	SE. ¼	6	11	15	.....do	
123	Marquette, Mich	....do	24	378	Frederick Sick	NW. ¼ of SE. ¼ and NE. ¼ of SW. ¼.	10	46	24	Proof not made	Sickness,
124	Reed City, Mich.....	....do	24, 25	5006	Jacob J. Conklin ..	W. ½ of NE. ¼, NE. ¼ of N. E ¼, and SE. ¼ of NW. ¼.	36	20	6	Proof not made in time and residence not established in time.	Ignorance.
125	Gainesville, Fla.....	....do	24	1142	Joseph Hatch	SE. ¼ of NW. ¼ and NE. ¼ of SW. ¼.	28	7	14	Proof not made in time.....	Do.
126	Huntsville, Ala	....do	24	2532	Robert C. Hawkins.	NW. ¼ of SW. ¼	22	14	15	.....do	Do.
127	....do	....do	24	1959	Bentley M. Burnett	SW. ¼ of SW. ¼	35	9	11	.....do	Do.
						N. ½ of NW. ¼	2	10	11		
						NE. ¼ of NE. ¼	3	.....	.....		
128	....do	....do	24	2077	Thomas G. Boman..	NW. ¼ of SE. ¼	34	14	15	.....do	Do.
129	....do	....do	24	1903	William E. Malone..	E. ½ of SW. ¼ and W. ½ of SE. ¼.	3	3	5	.....do	Do.
130	....do	....do	24	1993	John Cook	S. ½ of NE. ¼ and N. ½ of SE. ¼.	36	2	6	.....do	Do.
131	....do	....do	24	5256	John G. Wright ...	SW. ¼ of SE. ¼	28	7	3	..... do	Do.
132	....do	....do	24	1934	Thomas Hathcock..	N. ½ of NE. ¼	10	8	13	.....do	Do.
133	... do	....do	24	2107	Alexander Ragland.	S. ½ of NW. ¼	14	14	2	.....do	Do.
134	...do	....do	24	2062	Arthur Shannon ...	NE. ¼ of NW. ¼ and NW. ¼ of NE. ¼.	32	10	2	.....do	Do.

135	....do	....do	24	2055	John Hammer	SE. ¼ of NE. ¼, W. ½ of NE. ¼, and SE. ¼ of N W. ¼.	27	4	1	.....do		Do.
136	Salina, Kans	... do	24	16558	Jane S. Anthim	NW. ¼	6	20	5	.....do		Negligence.
137	....do	....do	24	15534	Hugh Howie	N. ½ of NW. ¼	10	15	1	.... do		Do.
138	Concordia, Kans	....do	24	12704	Evan Young	NW. ¼	11	4	1	.....do		Sickness.
139	Salina, Kans	... do	24	17562	Henry W. George	SE. ¼	32	14	9	.... do		Ignorance.
140	Benson, Minn	....do	24	5473	George H. Farewell.	S. ½ of SE. ¼ and S. ½ of S. W. ¼.	10	124	43	.....do		Do.
141	Wausau, Wis	....do	24	464	Hens Olsen Lia	SW. ¼ of NW. ¼	35	23	11	.....do		Do.
142	Eau Claire, Wis	....do	24	2650	Robt. Cunningham	NE. ¼ of SW. ¼	22	28	9	.... do		Do.
143	La Crosse, Wis	....do	24	6934	Florian Bauer	SE. ¼ of SE. ¼	26	25	12	.....do		Sickness.
144	do	....do	24	6076	Orvil S. Avery	S. ½ of NW. ¼	4	22	2	.....do		Poverty.
145	Fergus Falls, Minn	....do	25	5785	Sarah H. Bell	N. ½ of SW. ¼ and SW. ¼ of NW. ¼.	18	133	37	Residence not established in time.		Do.
146	Larned, Kans	....do	25	1592	H. J. Benedict	SW. ¼	14	17	64	.... do		Do.
147	Hays City, Kans	... do	25	560	Joseph M. Bell	N. ½ of SE. ¼ and S. ½ of NE. ¼.	15	18	18	.....do		Sickness.
148	Larned, Kans	....do	25	857	Eli Davidson	SW. ¼	9	24	12	.....do		Poverty.
149	Hays City, Kans	....do	25	160	George Ficken	SW. ¼	33	17	17	.... do		Sickness.
150	Salina, Kans	....do	24, 25	14008	Joseph M. Phillips	SW. ¼	14	19	5	Residence not established in time and proof not made in time.		Poverty.
151	Huntsville, Ala	....do	24	2161	John M. Wilson	SW. ¼ of SE. ¼, 5, and NW. ¼ of NE. ¼.	8	12	7	Proof not made in time		Ignorance.
152	....do	....do	24	2439	David F. Wilson	SW. ¼ of SE. ¼ and SE. ¼ of SW. ¼.	4	12	7	.....do		Do.
153	....do	....do	24	2336	Susannah Smith	S. ½ of SW. ¼ and S. ½ of S. E. ¼.	21	9	11	.....do		Do.
154	....do	... do	24	2140	E. L. Cotrell	S. ½ of SE. ¼, 7, and NW. ¼ of NE. ¼.	18	2	6	.....do		Do.
155	....do	....do	24	2079	Jas. Gassett, jr	SE. ¼ of NE. ¼	19	10	11	.....do		Do.
156	....do	....do	24	6667	Jas. M. Gore	E. ½ of SW. ¼	12	13	6	.....do		Do.
157	....do	...do	24	3078	Moses S. H. Wilson	E. ½ of NE. ¼, 30, NW. ¼ of NW. ¼.	29	14	13	.....do		Do.
158	Gainesville, Fla	....do	24	3653	Ephraim E. Page	E. ½ of SE. ¼ and S. ½ of N. E. ¼.	22	20	26	.....do		Do.
159	....do	....do	25	3637	Geo. W. Hall	Lots 1, 2, 9, and 10	18	9	23	Residence not established in time.		Do.
160	La Crosse, Wis	....do	25	7389	Geo. W. Owen	SW. ¼ of SE. ¼ and SE. ¼ of SW. ¼.	8	20	3	.....do		Do.
161	... do	... do	25	7125	Ole Simenson	N. ½ of NE. ¼ and SE. ¼ of NE. ¼.	34	21	6	.....do		Do.
162	Menasha, Wis	....do	25	1422	Martha T. Rhieland	SE. ¼	34	29	12	.....do		Poverty.
163	La Crosse, Wis	....do	24	6295	John Heaney	NW. ¼ of SE. ¼	17	15	2	Proof not made in time		Ignorance.
164	Yankton, Dak	... do	24	2185	Chas. T. Blacknick	NW. ¼	13	94	58	.....do		Sickness.
165	Beatine, Nebr	....do	24	4213	Robt. M. & Silas W. Clark.	NW. ¼	28	5	7	.....do		No guardian in time.
166	Grand Island, Nebr	....do	24	4 729	Wm. B. Larabee	W. ½ of SE. ¼, NE. ¼ of SE. ¼, and SW. ¼ of NE. ¼.	2	11	9	.....do		Ignorance.
167	New Orleans, La	....do	24	1506	Nancy Johnson	W. ½ of NE. ¼	30	2	1	.....do		Do.

Public land cases confirmed by the Board of Adjudication during the year ending June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
168	Central City, Colo..	Homestead..	24	155	Wm. A. Wortham...	S. ½ of NW. ¼.....	34	2	11	Proof not made in time	Ignorance.
169	Little Rock, Ark ..	....do	24	3060	Levisa F. Tarvis....	S. ½ of SW. ¼, SW. ¼ of SE. ¼, 20, and NW. ¼ of NW. ¼.	29	12	9	.....do.....	Poverty.
170	Camden, Ark	... do	24	2948	Robert Martin.....	NE. ¼ of SW. ¼.....	35	14	19	.....do	Ignorance.
171	Salt Lake City, Utah	....do	24	2303	Thomas Thorley..	SE. ¼ of SW. ¼ and lot 4 ...	30	36	11	.....do.....	Poverty.
						And NE. ¼ of NW. ¼ and lot 1.	31	.....	.....		
172	Crookston, Minn ..	....do	25	1073	George B. Jarrett...	Fractional SW. ¼	30	154	47	Residence not established in time.	Do.
173	Salina, Kans.....	....do	25	17707	C. A. Lewis	E. ½ of NW. ¼	18	14	14	.....do.....	Do.
174	Lincoln, Nebr	....do	19	10647	Joseph Semin.....	SE. ¼ of NW. ¼ and NE. ¼ of SW. ¼.	28	15	4	Conflict with prior homestead No. 8438, which was canceled August 2, 1877.	
175	Natchitoches, La ...	Cash.....	19	13471	Charles Hughes ..	N. ½ of NE. ¼	7	2	11	Conflict with selection for O. N. O. & G. W. Railroad, forfeited July 14, 1870.	
						And lot 9	6	.....	.....		
176	Gainesville, Fla	....do	11	3068	William N. Clark ..	NE. ¼ of NW. ¼ and SW. ¼ of NE. ¼.	6	22	29	Land not offered	Mistake.
177	....do	Homestead..	24	1653	Jesse Jacobs.....	NW. ¼ of SE. ¼ and NE. ¼ of SW. ¼.	25	16	21	Proof not made in time.....	Ignorance.
178	... do	....do	24	3560	James W. Williams.	SE. ¼	26	6	20	.... do	Do.
179	... do	....do	24	3730	Samuel Roberts.....	S. ½ of NE. ¼.....	4	14	20	.... do	Do.
180	... do	....do	24	866	William O. Conner..	NE. ¼ of SE. ¼	14	4	11	.....do.....	Do.
181	Huntsville, Ala ...	....do	24	2254	Joseph F. Shirey ...	E. ½ of NE. ¼	36	12	13	.....do.....	Do.
182	....do	....do	24	2205	Barney Brocks.....	N. ½ of SE. ¼.....	25	9	11	.....do.....	Do.
183	....do	... do	24	2046	Chas. W. Lockhart..	E. ½ of SE. ¼	4	13	5	.....do.....	Poverty.
184	....do	... do	24	2271	Susan Messer	S. ½ of SE. ¼, NE. ¼ of SE. ¼.	33	5	28	.....do	Do.
185	....do	....do	24	2227	William Freeman...	W. ½ of NW. ¼ and N. ½ of SW. ¼.	26	11	5	.....do	Ignorance.
186	....do	....do	24	1700	Thomas J. Gallatt ..	NW. ¼ of SE. ¼ and NE. ¼ of SW. ¼.	23	3	6	.....do	Do.
187	....do	....do	24	2060	A. M. Baber	NW. ¼ of SE. ¼.....	10	13	5	.....do.....	Do.
188	....do	....do	24	2061	Starling Braswell...	E. ½ of NW. ¼	9	12	11	.....do.....	Do.
189	....do	....do	24	2034	Charles A. Wright..	NE. ¼ of SE. ¼.....	34	7	4	.....do.....	Do.
190	....do	....do	24	2037	David Rogers.....	W. ½ of SE. ¼.....	30	12	3	.....do.....	Do.
191	....do	....do	24	2074	Nancy M. Hummeith.	SE. ¼ of NE. ¼.....	11	13	7	.....do.....	Do.
192	....do	....do	24	2016	John W. Rutledge ..	N. ½ of SE. ¼ and SE. ¼ of SE. ¼.	6	8	1	.....do.....	Do.
193	....do	....do	24	2160	Robert Carter	SE. ¼ of NW. ¼, NW. ¼ of SE. ¼, SW. ¼ of NE. ¼.	12	10	14	.....do.....	Do.

194	....do	....do	24	2154	Thomas Noles	N. ½ of NE. ¼ and E. ½ of NW. ¼.	5	12	8	.....do	Do.
195	....do	....do	24	2089	Jasper Gray	NW. ¼ of NE. ¼ and NE. ¼ of NW. ¼.	9	2	9	.....do	Do.
196	Harrison, Ark	... do	24	3767	Samuel E. Lain	NE. ¼ of NE. ¼	6	13	18	.....do	Do.
197	....do	....do	24	3782	Anderson Brown	N. ½ of NW. ¼	35	16	17	.....do	Do.
198	....do	....do	24	3790	Jackson Case	SW. ¼ of NW. ¼	27	14	23	.....do	Do.
199	....do	....do	24	3789	Samuel L. Reynolds	SE. ¼ of NW. ¼, 2, and NE. ½ of SW. ¼.	30	17	19	.....do	Do.
200	Sioux Falls, Dak	....do	24	2561	William Huntemer	NE. ¼	35	103	39	..... do	Do.
201	Litchfield, Minn	....do	24	7079	John McNally	NE. ¼	26	124	44	.....do	Do.
202	Redwood F., Minn	....do	24	894	Ole O. Evenson	S. ½ of NE. ¼	34	115	33	.....do	Do.
203	Natchitoches, La	....do	24	571	Irving Wallace	E. ½ of NE. ¼	18	17	8	.....do	Do.
204	Fergus Falls, Minn.	do	26	3456	Hans Anderson	S. ½ of NW. ¼	12	135	44	Residence not established in time.	Poverty.
205	Opelousas, La	Cash	19	7892	Clotilde Bemaux	Lots No. 2, 3, or NW. ¼, fractional S. ¼.	15	10	2	Conflict with grant to railroad, which was forfeited July 14, 1870. Land restored March 15, 1873.	
206	Benson, Minn	Homestead	25	7448	Peter Johansson	W. ½ of SW. ¼	12	119	38	Residence not established in time.	Presence of grasshoppers.
207	Litchfield, Minn	....do	25	7320	John Strom	E. ½ of NE. ¼	28	119	38	..... do	Do.
208	.. do	....do	25	7266	George W. Snowball	S. ½ of SE. ¼	8	123	40	.....do	Do.
209	.. do	....do	25	7240	Simon Rankin	N. ½ of NE. ¼	8	123	40	.....do	Do.
210	Alexandria, Minn	....do	25	3390	Francis McNable	S. ½ of SE. ¼	24	127	43	.....do	Inclement weather.
211	Worthington, Minn	... do	25	10420	Ole T. Takheem	NW. ¼	11	102	47	.....do	Poverty.
212	New Ulm, Minn	....do	25	9134	John Hash	NE. ¼	2	109	46	.....do	Do.
213	Litchfield, Minn	....do	24	7247	Ole O. Lunden	E. ½ of NE. ¼	8	124	40	.....do	Poverty.
214	Alexandria, Minn	....do	24	3274	Wm. J. Smith	S. ½ of SE. ¼ and lot 2 And NW. ¼ of NE. ¼	29 32	126	48	....do	Sickness.
215	Reed City, Mich	... do	24	4902	Mary J. Dunham	S. ½, NW. ¼ and S. ½ of NE. ¼	34	34	4	.....do	Do.
216	Marquette, Mich	.. do	24	561	Peter J. Golbach	NE. ¼	24	51	34	.... do	Do.
217	....do	....do	24	437	Wm. Carr	W. ½ of NE. ¼ and NE. ¼ of NW. ¼.	14	35	26	.....do	Do.
218	Fargo, Dak	.. do	24	7030	Peter Hansen	N. ½ of NW. ¼	30	138	52	.....do	House material destroyed by fire.
219	Beatrice, Nebr	...do	24, 25	3059	Marion Dunham	S. ½ of NW. ¼	2	3	6	Residence not established in time and proof not made in time.	Poverty.
220	New Orleans, La	....do	25	1533	James J. Lane	NE. ¼	70	10	1	Residence not established in time.	Do.
221	....do	.. do	24	572	James Jackson Miller.	SE. ¼ of NW. ¼ and NE. ¼ of SW. ¼.	10	20	8	Proof not made in time	Do.
222	Huntsville, Ala	.. do	24	2291	James M. Black	S. ½ of NW. ¼ and E ½ of SW. ¼.	32	13	6	.....do	Ignorance.
223	Wausau, Wis	....do	24	2233	Carl Josch	SW. ¼ of SE. ¼	36	23	4	.....do	Do.
224	La Crosse, Wis	....do	24	6173	Nels Nelson	S. ½ of SE. ¼	36	23	7	.....do	Do.
225	Topeka, Kans	....do	24	2724	John McDermott	E. ½ of NE. ¼	30	5	10	.....do	Do.

Public land cases confirmed by the Board of Adjudication during the year ending June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
226	Little Rock, Ark ...	Homestead .	24	3518	Friday Catton	E. ½ of SW. ¼ and W. ½ of SE. ¼.	9	1	13	Proof not made in time.	Poverty.
227	.....do	....do	24, 25	3505	Edward M. Kemp ..	E. ½ of NE. ¼	33	3	12	Proof not made in time and residence not established in time.	Sickness.
228	Concordia, Kans....	....do	24	12704	Arden G. Rice	NE. ¼	11	6	8	Proof not made in time.....	Negligence.
229	Kirwin, Kans.....	....do	27	5720	Nelly M. Way	NE. ¼	10	10	14	An abandoned wife makes proof.	
230	Lincoln, Nebr	....do	19	1649	Leander Hadsell....	S. ½ of SE. ¼	34	15	1	Conflict with prior T. C. E., No. 42, canceled June 25, 1883.	
231	Mitchell, Dak	Cash	Special	8429	William D. Reeves..	SW. ¼	27	101	63	See Commisioner's lette with papers.	
232	Reed City, Mich	Homestead .	24	5350	Christopher Mindel .	W. ½ of SW. ¼	21	36	4	Proof not made in time.....	Ignorance.
233	Marquette, Mich ...	....do	24	564	Levi Santo	SE. ¼ of NE. ¼	6	38	24	.....do.....	Do.
234	....do	....do	24	527	Hiram Barney.....	SE. ¼ of SE. ¼	10	35	27	.....do.....	Sickness.
235	Reed City	....do	24	5317	William J. Warner	NE. ¼	11	20	5	.....do.....	Do.
236	....do	....do	24	5327	Benjamin Walker ..	W. ½ of SE. ¼	17	34	7	....do.....	Ignorance.
237	....do	.. do	19,24,25	5351	Catharine Conklin ..	W. ½ of SW. ¼	24	16	12	Proof not made in time; in conflict with prior homestead No. 3752, which was canceled Feb. 16, 1874; residence not established in time.	Sickness.
238	Marquette, Mich ...	....do	24, 25	481	Louis Vasseur.....	SE. ¼ of SW. ¼ and lots 3, 4.	34	52	40	Proof not made in time and residence not established in time.	Not naturalized in time.
239	....do	....do	25	400	Michael Gomman ..	SE. ¼ of NW. ¼	29	42	3	Residence not established in time.	Sickness.
240	Jackson, Miss	....do	25	8864	Thomas G. Gordon..	SE. ¼ of SW. ¼, S. ½ of SE. ¼, and NE. ¼ of SE. ¼.	33	21	8	.....do.....	No water for family use.
241	....do	....do	24	796	Reubin Griffith	S. ½ of NE. ¼	30	16	12	Proof not made in time.....	Poverty.
242	....do	....do	24	635	T. S. Smith	NW. ¼ of SE. ¼ and NE. ¼ of SW. ¼.	4	18	4	.....do.....	Ignorance.
243	....do	....do	24	661	Mary A. Lambert ..	NE. ¼ of SW. ¼ and N. ½ of SE. ¼.	34	6	10	.....do.....	Do.
244	....do	... do	24	683	Francis M. Shields..	S. ½ of SE. ¼	20	14	15	.....do.....	Do.
245	....do	....do	24	783	Henry Backstrom ..	NE. ¼	15	11	11	.....do.....	Poverty.
246	Gainseville, Fla	Cash.....	11	3512	Joseph N. Fletcher	S. ½ of lot No. 11	1	8	13	Land not offered	
247	....do	....do	11	3514	Thomas A. Hix	E. ½ of NW. ¼	7	21	25	.....do.....	

248	Lincoln, Nebr	do	Special	2538	John Harris	S. ½ of NW. ¼	72	7	8	See Commissioner's letter with the papers in the case.	
249	Independence, Kans.	Homestead	Special	1318	John Miller	SW. ¼ of NE. ¼ and NW. ¼ SE. ¼.	4	24	15	do	
250	Huntsville, Ala	do	24	2438	Joseph N. Green	SW. ¼ of SW. ¼	8	12	11	Proof not made in time	Ignorance.
251	Worthington, Minn	do	24	6571	Ellis E. Sandbrake	NE. ¼ of SE. ¼	2	103	7	do	o.
252	Redwood, Minn	do	24	2644	Karl Sporer	SW ¼ of NW. ¼ and NW. ¼ of SW. ¼.	26	111	30	do	Do.
253	Tracy, Minn	do	25	4934	Jeremiah M. Baker	SE. ¼	22	107	43	Residence not established in time.	Sickness.
254	Worthington, Minn	do	25	6592	Christopher Helgeson.	SE. ¼	8	103	45	do	Do.
255	Tracy, Minn	do	25	4881	Adelbert G. Sisson	E. ½ of SW. ¼	2	106	46	do	Poverty.
256	Litchfield, Minn	do	25	7302	George W. Potter	NW. ¼	32	123	45	do	Grasshoppers.
257	Benson, Minn	do	25	7474	Thorkel Halverson	N. ½ of NW. ¼	32	120	41	do	Do.
258	Litchfield, Minn	do	25	7315	William Rutherford	S. ½ of NE. ¼	18	118	37	do	Do.
259	Redwood Falls, Minn.	do	25	496	O. J. Datsly	W. ½ of NW. ¼	12	114	40	do	Sickness.
260	Marquette, Mich	do	25	460	E. Chapman	SW. ¼	2	42	7	do	Poverty.
261	Read City, Mich	do	25	5431	George Lee	SW. ¼	10	32	4	do	Sickness.
262	do	do	25	5250	Stephen Kissinger	SW. ¼ of SW. ¼ Fractional Lots 1 and 2 NW. ¼ of NW. ¼	1 2 11 12	35	3	do	Do.
263	Marquette, Mich	do	24	365	Peter O'Conner	N. ½ of SE. ¼	32	47	24	Proof not made in time	Ignorance.
264	do	do	24	514	Malachy Delany	E. ½ of SW. ¼	4	46	24	do	Do.
265	Grand Island, Nebr.	do	24	6290	Hiram T. Johnson	NE. ¼	4	20	6	do	Do.
266	do	do	24	753	Heinrich Mahn	S. ½ of SW. ¼	2	10	10	do	Guardian not appointed in time.
267	Mobile, Ala	do	24	552	William M. Dolior	E. ½ of SE. ¼ and SW. ¼ of SE. ¼.	20	5	3	do	Sickness.
268	Huntsville, Ala	do	24	2037	Celia Blevins	N. ½ of NE. ¼	12	12	6	do	Negligence.
269	do	do	24	1767	Andrew J. Jackson	SE. ¼ of NE. ¼ and NE. ¼ of SE. ¼.	36	14	4	do	Ignorance.
270	do	do	24	4431	Wm. S. Morgan	SW. ¼ of S. ¼ NW. ¼ of NW. ¼	18 19	9	7	do	Sickness.
271	Springfield, Miss	do	24	6922	Robert Welsch	W. ½ of SW. ¼	27	33	72	do	Poverty.
272	Bloomington, Nebr.	do	25	4044	David S. Smith	N. ½ of SE. ¼ and SW. ¼ of SE. ¼, and NE. ¼ of SW. ¼	24	4	25	Residence not established in time.	
273	Wausau, Wis	do	20	2300	August Strelee	N. ½ of SW. ¼	30	29	3	Had not declared his intention to become a citizen at date of entry.	
274	Falls Saint Croix, Wis.	do	24, 25	3628	Syvert Pedersen	S. ½ of SE. ¼, and SE. ¼ of SW. ¼.	22	31	13	Had not declared his intention to become a citizen at date of entry; final proof not made in time	Ignorance.
275	Wa Keeney, Kans	do	20	5621	Peter Petersen	SW. ¼	28	20	23	Had not declared his intention to become a citizen at date of entry.	
276	Montgomery, Ala	do	24	2505	Benjamin F. Gowins	E. ½ of NW. ¼	10	16	3	Proof not made in time	Do.

Public land cases confirmed by the Board of Adjudication during the year ending June 20, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
277	Montgomery, Ala...	Homestead	25	2426	Augustus Kirkland	SE. ¼ of NE. ¼, and NE. ¼ SE. ¼	7	5	27	Proof not made in time.....	Ingnorance.
278	....do.....	....do.....	25	1939	Oliver C. Fowler....	W. ½ of NW. ¼, and NW. ¼ of SW. ¼	26	21	9	.....do.....	Do.
279	.. do.....	... do.....	25	1942	Orvin W. Reaves ..	SE. ¼ of NE. ¼	27	22	21	.... do.....	Do.
280	....do.....	... do.....	25	1946	Nathan C. Duke ..	W. ½ of NE. ¼	22	11	22	.....do	Do.
281	....do.....	... do.....	25	2308	Ephraim N. Robbins	NW. ¼ of NE. ¼.....	20	75	4	.....do.....	Do.
282	... do.....	....do.....	25	2350	William H. Eason ..	SW. ¼ of SE. ¼, and NE. ¼ of SW. ¼.	36	18	3	.....do.....	Do.
283	....do.....	....do.....	25	2780	James J. Lard	SE. ¼ of SW. ¼ and N. ½ of NE. ¼	10 30	75	6	..... do.....	Do.
284	....do.....	....do.....	25	2491	Sarah Scipper	SW. ¼ of NE. ¼, and W. ½ of SE. ¼ and SE. ¼ of SW. ¼.	15	20	13	.....do.....	Do.
285	....do.....	....do.....	25	3081	George Heplin.....	NE. ¼ of NW. ¼ and NW. ¼ of NE. ¼ and S. ½ of NE. ¼	20	20	11	.....do.....	Do.
286	....do.....	... do.....	25	3041	Seaborn C. Jones ...	W. ½ of SE. ¼ and E. ½ of SW. ¼.	15	2	22	.....do	Do.
287	....do.....	....do.....	25	3070	Nancy Hasty	NW. ¼ of NE. ¼ and E. ½ of NW. ¼.	25	5	28	.....do.....	Do.
288	....do.....	....do.....	25	3006	Martin C. Litton ...	NW. ¼ of SE. ¼ and NE. ¼ of SW. ¼.	24	24	9	.....do.....	Do.
289	....do.....	....do.....	25	2999	Daniel J. Botton..	NE. ¼ of SE. ¼ ..... And SW. ¼ of NW. ¼ and W. ½ of SW. ¼.	30 29	17	8	..... do.....	Do.
90	....do.....	...do.....	25	2927	Dixon H. Anderson	SW. ¼ of NE. ¼ and W. ½ of SE. ¼. NW. ¼ of NE. ¼.	2 11	2	27	.....do.....	Do.
291	....do.....	....do.....	25	2917	Elizabeth Spurlin...	E. ½ of SE. ¼	36	8	17	.....do	Do.
292	....do.....	....do.....	25	2878	Wm. C. Hains.....	SW. ¼ of NW. ¼.....	29	21	17	.....do.....	Do.
293	....do.....	....do.....	25	2693	Nancy Gilman....	SW. ¼ of SE. ¼ and S. ½ of SW. ¼ SE. ¼ of SE. ¼	14 15	17	6	.....do.....	Do.
294	....do.....	....do.....	25	2558	Armstron C. Crawford	E. ½ of SW. ¼.....	2	15	8	.....do.....	Do.
295	....do.....	....do.....	25	2525	Eliza C. Thompson	E. ½ of SE. ½ ..... NW. ¼ of SW. ¼	26 25	17	10	.....do.....	Do.
296	....do.....	... do.....	24, 25	1943	John J. Fail	SW. ¼ of NW. ¼ and NW. ¼ of SW. ¼.	8	9	13	Proof not made in time and residence not established in time.	Do.
297	... do.....	....do.....	24, 25	2974	Joseph Thrasher, jr	NE. ¼ of NE. ¼	36	21	6	Proof not made in time	Do.

298	....do	....do	24, 25	3051	Edward Montgomery.	NW. ¼ of SW. ¼	29	6	2	..... do	Do.
299	Redwood Falls, Minn	....do	24	2675	James Wardrop	SE ¼	12	113	40	..... do	Negligence.
300	Wausau, Wis	... do	24	7406	Watley Halverson	N. W. ¼ of NE. ¼ and NE. ¼ of NW. ¼.	10	15	2	.....do	Do.
301	Eau Claire, Wis	... do	24	3545	Alonzo Kingman	N. ½ of NE. ¼	30	29	7	..... do	Ignorance.
302	Montgomery, Ala	....do	24	1971	John L. Roper	W. ½ of SW. ¼	20	20	1	..... do	Do.
303	....do	....do	24	1580	Lydia Purvis	NW. ¼ of SE. ¼, NE. ¼ of SW. ¼, SE ¼ of NW. ¼ SW. ¼ NE. ¼.	20	2	25	.....do	Do.
304	....do	....do	24	1736	James P. Williams	E. ½ of NW. ¼ and NW. ¼ of NE. ¼	28	15	5	..... do	Do.
305	....do	....do	24	2300	M. P. Lard	SW. ¼ of SE. ¼	18	15	6	....do	Do.
						And N. ½ of NE. ½	19				
306	....do	....do	24	2306	John M. Sherer	NW. ¼ of NE. ¼	2	15	7	.....do	Do.
307	Ironton, Mo	....do	24	2404	Elias Polk	W. ½ of SE. ¼, SE. ¼ of SW. ¼, SW. of SE. ¼.	24	27	8	.....do	Sickness.
308	Salt Lake City, Utah	.. do	24	2438	Margaret A. Busenback.	SW. ¼ of NE. ¼ and lots 1 and 2.	5	6	4	....do	Ignorance.
						And SE. ¼ of SE. ¼	32	5	4		
309	....do	... do	24	2455	Thomas B. Walker	SW. ¼ of NE ¼	32	6	2	.....do	Do.
310	Grand Island, Nebr.	....do	24	6410	Calvin A. Goodrich	SE. ¼	38	12	12	.... do	Do.
311	La Crosse, Wis	....do	24	6356	F. Klug	SW. ¼ of NE. ¼	6	21	11	.....do	Do.
312	Falls Saint Croix, Wis.	....do	24	2836	Daniel Bartlett	N. fractional ¼ of SW. ¼	30	35	14	.....do	Do.
313	New Orleans, La	....do	24	1274	Heirs of Archile Sarvie.	W. ½ of NE. ¼ and W. ½ of SE. ½.	23	11	4	.....do	Do.
314	Marquette, Mich	....do	24	399	James R. Sykes	E. ½ of SW. ¼, SW. ¼ of SW. ¼, SW. ¼ of SE. ¼.	31	47	1	.....do	Do.
315	Larned, Kans	....do	24	742	Finis A. Galbreath	E. ½ of NW. ¼	10	20	16	.....do	Do.
316	Redwood Falls, Minn	....do	24	120	Albert H. Morgan	NE. ¼	30	112	39	.....do	Poverty.
317	Susanville, Cal	....do	24	1139	Stephens Stevens	S. ½ NE. ¼, SE. ¼ of NW. ¼, NE. ¼ of NW. ¼.	5	44	14	.....do	Ignorance.
318	....do	....do	24	1133	John P. F. Gosch	SE. ¼ of NE. ¼	34	42	9	....do	Do.
						N. ½ of NW. ¼, SW. ¼ of NW. ¼.	35				
319	Stockton, Cal	....do	24	7328	Jesus Domingues	S. ½ of SE. ¼	15	5	16	.....do	Do.
320	Visalia, Cal	....do	24	1554	Sashwell Turner	W. ½ of NW. ¼ and W. ½ of SW. ¼.	10	24	30	.....do	Delay in mails.
321	Gainesville, Fla	Cash	11	3993	James McGregor	S. ½ of NE. ½	20	17	19	Land not offered	Ignorance.
322	Jackson, Miss	....do	11	35830	H. Rouse	E. ½ of NW. ¼ W. ½ of NE. ¼	30	1	14	.....do	Do.
323	Montgomery, Ala	Homestead	24	3196	William H. Dison	E. ½ of SE. ¼	32	15	3	Proof not made in time	Do.
324	....do	....do	24	3190	Catharine Altman	SW ¼ of SE. ¼ and SE. ¼ of SW. ¼.	28	11	20	.... do	Do.
325	....do	....do	24	3146	Joseph Tait	SW. ¼ of NE. ¼ and SE. ¼ of NW. ¼.	32	1	6	.... do	Do.
326	Huntsville, Ala	....do	24	2667	John F. Hamilton	Fractional SE. ¼ of NW. ¼	9	11	15	.....do	Do.
327	Gainesville, Fla	....do	24	2980	Alexander Patterson.	NE. ¼ of SW. ¼	14	2	13	.....do	Do.
328	La Crosse, Wis	....do	24	4739	Rufus Clark	S. ½ of NW. ¼ and N. ½ of SW. ¼.	32	20	2	.....do	Do.
329	....do	....do	24	4762	Edwin Hall	W. ½ of NW. ¼	14	21	3	.....do	Do.

Private land cases confirmed by the Board of Adjudication during the year ended June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
330	La Crosse, Wis	Homestead	24	4748	Ole Ammundson	E. ½ of NW. ¼	30	21	4	Proof not made in time	Ignorance.
331	do	do	20	4785	Mary O'Brien	SW. ¼ of NE. ¼ and NW. ¼ of SE. ¼.	22	14	8	Had not declared his intention to become a citizen at date of entry.	
332	Bloomington, Nebr	do	27	6997	Peter M. Moodie	E. ½ of NE. ¼	8	1	19	Proof made by a deserted wife.	
						And W. ½ of NW. ¼	9				
333	Niobrara, Nebr	do	25	3397	Elijah H. Thompson	S. ½ of SW. ¼ and NE. ¼ of SW. ¼, SW. ¼ of SE. ¼.	3	28	11	Residence not established in time.	
334	Bloomington, Nebr	do	24	3031	John Weston	E. ½ of SW. ¼ and S. ½ of SE. ¼.	35	1	18	Proof not made in time	
335	Redwood Falls, Minn	do	24	2699	Henry Braley	SE. ¼	26	114	36	do	Do.
336	Fergus Falls, Minn	do	25	5552	Luther Bates	NW. ¼	24	120	47	Residence not established in time.	Sickness.
337	Larned, Kans	do	25	1680	Caleb L. Scott	SW. ¼	10	21	21	do	Delayed in travel.
338	Hays City, Kans		24	303	Franz Brumgart	E. ½ of SE. ¼	26	14	17	Proof not made in time	Sickness.
339	Salina, Kans	do	24	15533	August Goschlich	E. ½ of SW. ¼	26	12	6	do	Party insane.
340	Del Norte, Colo	do	20	587	Hugh W. Gilchrist	SW. ¼	22	38	8	Party had not declared his intention to become a citizen at date of entry.	
341	New Orleans, La	do	25	1456	Theo. C. Shilling	SW. ¼ of SE. ¼	7	1	9	Residence not established in time.	Poverty.
						W. ½ of NE. ¼	18				
342	Marquette, Mich	do	25	583	John Clark	N. ½ of NW. ¼, SE. ¼ of NW. ¼, SW. ¼ of NE. ¼.	1	50	6	do	Do.
343	Jackson, Miss	do	24, 25	5965	John Clark	W. ½ of NW. ¼	1	2	2	Residence not established in time, and proof not made in time.	Sickness.
						SW. ¼ of SW. ¼	36	3	2		
344	Visalia, Cal	do	24, 27	1548	Mary A Hackney	SW. ¼ of SE. ¼ and SE. ¼ of SW. ¼.	18	15	27	Proof not made in time and made by a deserted wife.	
						And W. ½ of NE. ¼	19				
345	Sacramento, Cal	do	24	1791	John Martin	NE. ¼ of SE. ¼	34	6	11	Proof not made in time	Ignorance.
346	Stockton, Cal	do	24	1399	Elizabeth Quinn	W. ½ of SE. ¼ and N. ½ of SW. ¼.	15	1	12	do	Not a citizen in time.
347	Gainesville, Fla	Cash	19	3446	James C. Bell	Lot 1	20	10	14	Conflict with swamp claim, which was rejected November 15, 1881.	
348	Pueblo, Colo	Homestead	24	1375	John S. Patten	E. ½ of NE. ¼ and E. ½ of SE. ¼	7	27	70	Proof not made in time	Ignorance.
349	Denver, Colo	do	24, 25	1665	Wm. M. Slaughter	SW. ¼	9	7	69	Proof not made in time, and residence not established in time.	Poverty.

350	....do	....do	20	1661	John H. Nelson	SW. ¼	22	6	68	Had not declared his intention to become a citizen at date of entry.	
351	....do	....do	27	1664	Susie J. Freeman	E. ½ of NE. ¼, SW. ¼ of NE. ¼, and NE. ¼ of SE. ¼.	35	10	71	Proof not made in time	
352	Sacramento, Cal	....do	24	1763	Hugh Flynn	N. ½ of SW. ¼ and SW. ¼ of SW. ¼.	29	5	13	....do	Ignorance.
353	Eureka, Nev	....do	24	64	Warren Shoecraft	NW. ¼	19	39	52	....do	Do.
354	Huntsville, Ala	....do	24	2665	David H. Davis	S. ½ of SE. ¼	32	11	9	....do	Do.
355	....do	....do	24	4129	Charles H. Foote	W. ½ of SW. ¼	36	6	13	....do	Do.
356	Niobrara, Nebr	....do	24	3307	Lars Hansen	W. ½ of NW. ¼	22	27	8	....do	Do.
357	Grand Island, Nebr	....do	24	6263	John T. Moore	SE. ¼ of NW. ¼, SW. ¼ of NE. ¼.	4	11	19	....do	Do.
358	Lincoln, Nebr	....do	24, 27	15730	Francis Theodore	S. ½ of SE. ¼	10	14	3	Proof not made in time, and proof made by a deserted wife.	Citizenship not perfected in time.
359	Menasha, Wis	....do	24	1361	Frank Helmer	NE. ¼ of NW. ¼, SW. ¼ of NE. ¼.	18	29	22	Proof not made in time	Delay in mails.
360	Eau Claire, Wis	....do	24	1298	M. B. Coon	N. ½ of NW. ¼	24	25	8	....do	Ignorance.
361	New Orleans, La	....do	19, 24	1552	Casper M. Fogs	S. ½ of NE. ¼ and S. ½ of NW. ¼.	10	8	14	Proof not made in time, and conflict with prior homestead No. 1030, canceled February 13, 1878.	
362	Larned, Kans	....do	24	717	Lander Shores	E. ½ of SW. ¼	32	21	7	Proof not made in time	Sickness.
363	Wichita, Kans	....do	24	4016	George Aelte	SW. ¼	28	24	4	....do	Ignorance.
364	....do	....do	24	6128	Ann Shanly	SE. ¼	6	25	7	....do	Do.
365	Eau Claire, Wis	....do	24	2943	Wilbur F. Cults	W. ½ of NE. ¼	12	27	1	....do	Do.
366	Roseburg, Oreg	....do	24	1678	James H. Teeters	N. ½ of NW. ¼, SE. ¼ of NW. ¼, SW. ¼ of NE. ¼.	12	21	2	....do	Sickness.
367	New Orleans, La	....do	24	1568	Buckey Fields	NE. ¼ of SE. ¼	23	9	14	....do	Do.
						And NW. ¼ of SW. ¼	24				
368	Natchitoches, La	....do	24	1110	James C. Armstrong	S. ½ of SW. ¼	34	9	11	....do	Ignorance.
369	....do	....do	24	1158	Kelly Johnson	W. ½ of NE. ¼	18	17	6	....do	Do.
370	Denver, Colo	....do	24	1717	Allen H. Sanders	E. ½ of NW. ¼ and SW. ¼ of NW. ¼.	3	8	52	....do	Do.
371	Gainesville, Fla	....do	24	3028	John Baird	Lot 2	31	30	39	....do	Do.
						And lots 1, 5, 6, and 7	6	31	39		
372	....do	....do	24	1758	Henry Johnson	E. ½ of SE. ¼	13	2	27	....do	Do.
373	Ironton, Mo	....do	24	2139	John Dean	SE. ¼ of SW. ¼, W. ½ of SE. ¼ SW. ¼ of NE. ¼.	28	30	10	....do	Sickness.
374	Niobrara, Nebr	....do	24	3322	William E. Staman	NE. ¼	1	29	6	....do	Ignorance.
375	Huntsville, Ala	....do	24	2661	Hiram M. Lambert	W. ½ of NW. ¼, SE. ¼ of NW. ¼, and NE. ¼ of SW. ¼.	34	11	11	....do	Do.
376	....do	....do	24, 25	2680	Jane W. Cox	NW. ¼	25	9	11	Proof not made in time, and residence not established in time.	Do.
377	Des Moines, Iowa	....do	19	2098	William H. Tufts	NW. ¼	18	91	40	Conflict with prior T. C. E. No. 3, canceled September 18, 1875.	
378	Reed City, Mich	....do	Special.	8188	Christian Dietz	E. ½ of NE. ¼	14	30	12	See Commissioner's letter with case.	
379	La Crosse, Wis	....do	24	5511	John Madden	S. ½ of SE. ¼	14	11	7	Proof not made in time	Do.

Public land cases confirmed by the Board of Adjudication during the year ending June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
380	La Crosse, Wis	Homestead	24	6220	Loven D. Hanchet	NW. ¼ of NW. ¼	36	18	1	Proof not made in time	Ignorance.
381	do	do	24, 25	6097	Daniel T. Hockert	E. ½ of NW. ¼	4	20	1	Proof not made in time, and residence not established in time.	Sickness.
382	do	do	25	6973	John A. Thompson	NE. ¼	34	24	8	Residence not established in time.	Poverty.
383	do	do	25	7273	Peter Peterson	N. ½ of SW. ¼ and N. ½ of SE. ¼.	14	20	6	do	Sickness.
384	do	do	25	7134	Adrian Galster	SE. ¼ of SE. ¼	2	22	5	Residence not established in time.	Poverty.
385	Dalles, Oreg	do	24	362	Penelton Blevins	NW. ¼ of SE. ¼, NE. ¼ of SW. ¼, and lots 3 and 4.	18	14	19	Proof not made in time	Sickness.
386	Montgomery, Ala	do	24	2449	Mary A. C. Owens, widow of Isaac A. Arnold.	E. ½ of NW. ¼ and NE. ¼ of SW. ¼. NW. ¼ of NE. ¼	19	20	11	do	Ignorance.
387	Huntsville, Ala	do	25	1708	H G. Frederick	S. ½ of NW. ¼ and N. ½ of SW. ¼.	30	9	11	Proof not made in time and residence not established in time.	Do.
388	do	do	24	3420	Isaac B. Arnold	NE. ¼ of SW. ¼, NW. ¼ of SE. ¼, SE. ¼ of NW. ¼, and SW. ¼ of NE. ¼.	15	12	10	do	Sickness.
389	Montgomery, Ala	do	24	1750	Thomas Taylor	W. ½ of SE. ¼	26	2	3	do	Ignorance.
390	do	do	24	2353	Kate Moseley	SW. ¼ of NW. ¼	10	6	11	do	Do.
391	do	do	24	3053	Mathew Owen	W. ½ of SE. ¼	13	3	3	do	Do.
392	do	do	24	3202	Ambrose N. Meadows.	SW. ¼ of SE. ¼, and SE. ¼ of SW. ¼.	30	2	9	do	Do.
393	do	do	25	1553	Benjamin F. Webb	N. ½ of NE. ¼, NE. ¼ of NW. ¼. And SW. ¼ of SE. ¼	6 31	3 4	28 28	Residence not established in time.	Poverty.
394	do	do	24	3206	Heirs of Elizabeth Hillyer.	S. ½ of NW. ¼, and NW. ¼ of NW. ¼.	20	21	18	Proof not made in time	Ignorance.
395	do	do	24	3231	Charles J. Rasco	SW. ¼ of SE. ¼	11	21	8	do	Do.
396	do	do	24	3233	Henry M. Smith	S. ½ of NE. ¼, and NW. ¼ of NE. ¼. And SW. ¼ of SE. ¼	36 25	2	25	do	Do.
397	do	do	24	1644	Elias M. Boid	Fractional SW. ¼ of SW. ¼.	12	21	13	do	Do.
398	do	do	24	1779	Richard E. Braden	N. ½ of SW. ¼, and SW. ¼ of SW. ¼. And NW. ¼ of NW. ¼	24 25	18	10	do	Do.

399	Huntsville, Ala	do	24	2703	William T. Kicker	SW. ¼ of SW. ¼ 30, NW. ¼ of NW. ¼.	31	11	8	do	Sickness.
						And SE. ¼ of SE. ¼ 25, and NE. ¼ of NE. ¼.	36	11	9		
400	New Orleans, La	do	24	1600	Robert T. Green	S. ½ of NE. ¼	10	4	10	do	Ignorance.
401	do	do	24	1544	George Ives	SE. ¼ of SW. ¼	20	21	2	do	Do.
402	Gainesville, Fla	do	24	3274	Muck E. Williams	SE. ¼ of NW. ¼	34	12	19	do	Do.
403	Niobrara, Nebr	do	24	3341	John O. Dempsey Nightingale.	NW. ¼	7	29	14	do	Do.
404	Salina, Kans	do	24	17352	Clement A. Dodge	N. ½ of SE. ¼	32	13	15	o	Do.
405	La Crosse, Wis	do	24	7194	Joseph Zetck	SW. ¼ of NW. ¼, and W. ½ of SW. ¼.	6	22	9	Residence not established in time.	Bad roads.
405	Gainesville, Fla	Cash	19	4163	Mary A. Campbell	Lot 3 and N. ½ of SW. ¼ and SW. ¼ of SW. ¼.	1	25	36	Conflict with homestead claim of T. H. McIntosh, which was rejected July 15, 1882.	
406	Montgomery, Ala	Homestead	24	3159	Joshua S. Ware	NW. ¼ of SW. ¼ and SW. ¼ of NW. ¼.	12	19	5	Proof not made in time	Ignorance.
407	do	do	24	5649	Amanda Vingard	SE. ¼ of NE. ¼	3	20	22	do	Do.
408	do	do	24	3007	Wallace J. Joiner	SE. ¼ of SW. ¼	8	6	12	do	Do.
409	Huntsville, Ala	do	24	3855	William George	N. ½ of NW. ¼	20	20	4	do	Do.
410	Gainesville, Fla	do	24	3603	David Johnson	N. ½ of NW. ¼	9	14	20	do	Do.
411	Hays City, Kans	do	24	197	William T. Neale	S. ½ of NE. ¼	12	13	20	do	Do.
412	Litchfield, Minn	do	24	6584	Kans Kanson	W. ½ of NW. ¼, and lots 2 and 3.	26	122	44	do	Do.
413	Benson, Minn	do	25	7397	John H. Henrickson	W. ½ of SW. ¼, SE. ¼ of SW. ¼ and lot 8.	6	122	43	Residence not established in time.	Poverty.
414	Falls Saint Croix, Wis.	do	24, 25	2859	Louis Gamache	S. ½ of NE. ¼, and S. ½ of NW. ¼.	34	34	15	Residence not established in time and proof not made in time.	Ignorance.
415	Wausau, Wis	do	27	3350	Peter Ring	SE. ¼ of NE. ¼, and NE. ¼ of NW. ¼.	10	34	2	Proof made by a deserted wife.	
416	Menasha, Wis	do	19	791	Samuel Savy	SW. ¼	34	29	20	Conflict with prior homestead entry No. 1044, which was canceled January 4, 1831.	
417	Yankton, Dak	do	24	2304	Vaclar Pechons	E. ½ of SE. ¼ 11, and W. ½ of SW. ¼.	12	94	59	Proof not made in time	Do.
418	Lincoln, Nebr	do	24	15766	Alexander Shank	N. ½ of NE. ¼	6	14	3	do	Do.
419	Grand Island, Nebr	do	24	9545	Silas Crane	S. ½ of SW. ¼	26	15	8	do	Do.
420	do	do	27	7438	John F. Davis	NW. ¼	2	19	7	Proof made by a deserted wife.	
421	New Orleans, La	do	24	1601	William M. Ryan	SW. ¼ of NE. ¼, and NW. ¼ of SE. ¼ and E. ½ of SW. ¼.	15	6	6	Proof not made in time	Deaths.
422	do	do	25	1548	Joseph M. Yates	NW. ¼ of SW. ¼, and SW. ¼ of NW. ¼.	26	20	1	Residence not established in time.	Poverty.
423	Jackson, Miss	do	24	1693	Alexander Conerly	N. ½ of NE. ¼	36	2	8	Proof not made in time	Ignorance.
						W. ½ of NW. ¼.	35	2	9		
424	do	do	24	2300	Samuel Fairley	NW. ¼	33	1	8	Proof not made in time	Do.
425	do	do	24	2301	Nancy Stuckey	E. ½ of SW. ¼ and N. ½ of SE. ¼.	5	2	2	do	Do.

Public land cases confirmed by the Board of Adjudication during the year ending June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
426	Jackson, Miss	Homestead	24	2315	Henry King	SW. ¼ of SW. ¼	15	4	14	Proof not made in time	Ignorance.
427	do	do	24	2317	James Pittman	SW. ¼	29	4	18	do	Do.
428	do	do	24	2320	Thomas Brown	SW. ¼ of NE. ¼	21	2	2	do	Do.
429	do	do	24	2322	Addison C. Manning	NE. ¼ of SE. ¼ N. ½ of SW. ¼ and SW. ¼ of NW. ¼.	24 19	2 2	3 4	do	Do.
430	do	do	24	2326	Lewis Price	SW. ¼ of SW. ¼ SE. ¼ of SE. ¼ N. ½ of NE. ¼	36 35 2	7 6	20 20	do	Do.
431	do	do	24	2327	Jane McDade	NE. ¼ of SE. ¼	6	10	17	do	Do.
432	do	do	24	2331	William Campbell	N. ½ of SE ¼ and S. ½ of NE. ¼.	31	1	1	do	Do.
433	do	do	24	2336	Joseph S. Burns	S. ½ of NE. ¼	33	7	9	do	Do.
434	do	do	24	2344	Willie Tennart	SE. ¼ of SE. ¼	29	4	14	do	Do.
435	do	do	24	2345	Margaret, widow of Stephen Cole.	Lot No. 15	1	8	16	do	Do.
436	Bloomington, Nebr	do	24	2235	Robert Reilley	W. ½ of NW. ¼ And W. ½ of SW. ¼	5 32	2 3	19 19	do	Do.
437	Tracy, Minn	do	25	4957	Simeon F. Shambeau	NW. ¼	28	109	46	Residence not established in time.	Do.
438	Benson, Minn	do	25	7588	Oscar A. Carlson	NE. ¼	28	123	47	do	Do.
439	Redwood Falls, Minn	do	25	2719	Conrad Echart	W. ½ of SE. ¼, SE. ¼ of SE. ¼, SW. ¼ of NE. ¼.	30	113	31	do	Do.
440	Wichita, Kans	do	24	5870	Joseph Baugham	SE. ¼	6	23	8	Proof not made in time	Do.
441	Jackson, Miss	do	24	2371	Turpin Q. Williamson.	S. ½ of NE. ¼ and SE. ¼ of NW. ¼.	2	9	19	do	Do.
442	do	do	24	2365	Sarah Robbins	NE. ¼ of NE. ¼	29	6	18	do	Do.
443	do	do	24	2359	John White	SW. ¼ of NE. ¼ and NW. ¼ SE. ¼.	21	6	16	do	Do.
445	do	do	24	2350	Caroline Hall	Lot 1, S. ½ of Lot 2, and N. ½ of Lot 7.	3	3	6	do	Do.
446	do	do	24	2349	John E. Wilson	E. ½ of NE. ¼, SW. ¼ of NE. ¼	4	5	10	do	Do.
447	do	do	24	2348	Pinkney G. Hillman	E. ½ of SW. ¼	27	3	8	do	Do.
448	do	do	24	2368	George Williams	N. ½ of NE. ¼	10	5	6	do	Poverty.
449	do	do	24	5594	William C. Brown	E. ½ of SW. ¼ and SE. ¼ of NW. ¼ and SW. ¼ of NE. ¼.	35	10	19	do	Ignorance.
450	do	do	24	7102	Celia Green	E. ½ of SW. ¼	26	25	3	do	Do.
451	Sacramento, Cal	do	24	537	Floyd Farrar	NE. ¼ of NW. ¼	22	16	8	do	Do.
452	Montgomery, Ala	do	24	1396	Robert Hurley	NE. ¼ of NW. ¼	12	9	9	do	Do.
453	do	do	24, 25	3275	DeKalb Rayburn	E. ½ of NW. ¼ and NE. ¼ of SW. ¼.	17	11	8	Proof not made in time, and residence not in time.	Do.

454	....do	....do	24	3280	Comodore Reid	W. ½ of SE. ¼	22	3	3	Proof not made in time	Do.
455	....do	....do	24	3258	Joshua Polk	SE. ¼ of NE. ¼	2	7	2	....do	Do.
456	Huntsville, Ala	....do	24	4046	William Castello	S. ½ of SE. ¼	26	6	9	....do	Do.
457	....do	....do	24	2046	Frederick Bohm	NE. ¼ of SE. ¼ and SE. ¼ of of NE. ¼.	2	10	3	....do	Poverty.
458	....do	....do	24	2019	Thomas J. Looser	S. ½ of NE. ¼ and S. ½ of NW. ¼.	27	5	8	....do	Ignorance.
459	....do	....do	24	2090	John Phillips	W. ½ of SE ¼ and E. ½ of SW. ¼.	23	7	2	....do	Do.
460	....do	....do	24, 25	2770	Abraham McGalia	S. ½ of NW. ¼	13	1	2	....do	Do.
461	Sioux Falls, Dak	....do	24	7352	John Stephenson	NW. ¼	34	97	51	....do	Sickness.
462	Springfield, Dak	....do	25	810	Joseph E. Haynes	SE. ¼	20	98	58	.... do	Do.
463	Niobrara, Nebr	....do	24	3378	William Cronin	NE ¼	31	30	11	.... do	Do.
464	Natchitoches, La	....do	24, 25	603	Albert H. Thomas	NE. ¼ of NW. ¼, fractional	12	11	14	....do	Ignorance.
465	....do	....do	24	599	Dock Johnson	E. ½ of NE. ¼	18	17	6	....do	Do.
466	Susanville, Cal	....do	24	950	Robert Johnston	E. ½ of NW. ¼ and W. ½ of NE. ¼.	11	29	12	....do	Do.
467	Stockton, Cal	....do	24, 25	1419	James G. Crowder	SE. ¼	1	12	18	....do	Do.
468	Jackson, Miss	....do	24, 25	3519	Cornelia G. McLauren.	E. ½ of SW. ¼	29	2	8	....do	Do.
						And NW. ¼ of NE. ¼ and NE. ¼ of NW. ¼.	32	.....	.....		
469	Santa Fé, N. Mex	....do	19	460	Susan A. Tillman	NW. ¼ of SW. ¼	9	29	30	Conflict with donation entry No. 296, which was canceled October 10, 1883.	
						NW. ¼ of NW. ¼	10	20	30		
						NE. ¼ of NW. ¼	1	29	31		
470	Independence, Kans	....do	24	3295	Mary A. Tompkins	SE. ¼ of NW. ¼ and lot 4	4	25	22	Proof not made in time	Do.
471	Wichita, Kans	....do	24	6108	M. Bierschback	W. ½ of NW. fractional ¼	4	24	1	....do	Do.
472	Hays City, Kans	....do	24	263	John Scheck	S. ½ of NE. ¼	22	13	16	....do	Do.
473	....do	....do	24	262	Andrew Scheck	....do	22	13	16	....do	Do.
474	Salina, Kans	....do	24, 25	15571	Samuel Dumett	W. ½ of SW ¼	10	13	1	Proof not made in time and residence not established in time.	Sickness.
475	Hays City, Kans	....do	25	1771	Henry Glyn	E. ½ of NE. ¼	10	11	25	Residence not established in time.	Do.
476	Niobrara, Nebr	....do	24, 25	1821	Bradford Richmond	SW. ¼	25	30	6	Proof not made in time and residence not established in time.	Ignorance.
477	....do	....do	24	1671	Henry Phillips	NE¼	30	28	7	Proof not made in time	Do.
478	....do	....do	24	1720	Adam Winzel	Lots 13, 14, 15, 16, and lot 3.	12	88	4	5 p. m. Proof not made in time.	Ignorance; additional entry.
							32	29	9	6 p. m. Proof not made in time.	
479	North Platte, Nebr	....do	27	855	Elihu Currence	E. ½ of SW. ¼ and W. ½ of SE. ¼.	33	2	31	Proof made by a deserted wife.	
480	Tracy, Minn	....do	24	4968	Casius M. Herrman	SW. ¼	6	109	37	Proof not made in time	
481	Crookston, Minn	....do	24, 19	1128	Johnston Wilson	W. ½ of NW. ¼ and W. ¼ of SW. ¼.	20	138	40	Proof not made in time and conflict in part with swamp claim, which was rejected May 13, 1882.	
482	Litchfield, Minn	....do	25	7108	August Schultz	NE. ¼	20	122	42	Residence not established in time.	Poverty.
483	Yankton, Dak	....do	24	1969	Peter Kaufman	NE. ¼ of SW. ¼, lot 3 and N. ½ of SE. ¼.	18	98	55	Proof not made in time	Ignorance.

Public land cases confirmed by the Board of Adjudication during the year ending June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
484	Yankton, Dak	Homestead	24	2269	Nircis Drapo	W. ½ of SE. ¼, SE. ¼ of SE. ¼ 21, and lot 2.	28	98	69	Proof not made in time	Ignorance.
485	do	do	24	2257	Peter Loervene	NW. ¼	23	100	56	do	Do.
486	Marquette, Mich	do	25	416	Joseph Farrier	NE. ¼	4	40	4	Residence not established in time.	Do.
487	Natchitoches, La	do	24	1052	Jennie McCrowell	SW. ¼ of NW. ¼ and NW. ¼ of SW. ¼.	2	17	11	Proof not made in time	Do.
488	New Orleans, La	do	24	1514	Benjamin Pierce	Lot No. 3	34	4	13	do	Do.
489	Salt Lake City, Utah	do	24	2481	Cornelius Evans	N. ½ of SE. ¼, and SE ¼. of NE. ¼.	1	10	6	do	Sickness.
						And lot No. 6	6	10	7		
490	do	do	24	2345	John W. Curtis	SE. ¼, SW. ¼, sec. 5; NE. ¼, NW. ¼.	8	22	1	do	Do.
491	do	do	24	2294	Ann Elmer	SW. ¼ of NW. ¼, SW. ¼ of SW. ¼, N. ½ of SW. ¼.	23	1	1	do	Ignorance.
492	do	do	24	704	William W. Wilson	N. ½ of SW. ¼	22	3	4	do	Do.
493	do	do	24	1029	John C. Nails	SW. ¼ of NW. ¼, and lots 4, 5, 6.	25	5	1	do	Do.
494	do	do	20	2366	K. Peterson	Lot No. 1	18	10	2	Had not declared his intention at date of entry.	
495	do	do	20	2294	William V. Black	SW. ¼	33	17	7	do	
496	Denver, Colo	Cash	11	3519	Frank A. Seymour	SW. ¼ of SE. ¼	3	10	64	Land not offered at date of entry.	
497	Montgomery, Ala	Homestead	24	2244	Noah J. Vines	S. ½ of SW. ¼	18	17	5	Proof not made in time	Do.
498	do	do	24	1701	Eli Jordan	SW. ¼ of NW. ¼ and NW. ¼ of SW. ¼.	30	10	20	do	Do.
499	do	do	24	3259	Mary Lalland	SW. ¼ of NE. ¼	26	7	2	do	Do.
500	Huntsville, Ala	do	24	2029	Lucretia Carter	S. ½ SW. ¼, sec. 27 and N. ½ NW. ¼.	34	5	6	do	Do.
501	do	do	24	2761	Charles B. Britwell	E. ½, SW. ¼	7	10	12	do	Do.
502	Montgomery, Ala	do	25	2564	William B. Powell	NE. ¼ of NE. ¼	34	10	13	Residence not established in time.	Sickness.
503	Gainesville, Fla	do	24	3616	James B. Ward	W. ½, SE. ¼, E. ½, SW. ¼	6	2	13	Proof not made in time	Ignorance.
504	do	do	24	3438	Yancy Butler	SW. ¼ of SE. ¼, SE. ¼, SW ¼	32	14	20	do	Sickness.
505	do	do	24	3150	Arthur N. Harrington.	SW. ¼ of NW. ¼ and E. ½, NE. ¼, NE. ¼ of SE. ¼.	5	21	29	do	Negligence.
506	La Crosse, Wis	do	24	6718	Jacob Huntziker	SE. ¼ of SE. ¼	1	15	4	do	Ignorance.
507	do	do	24	5957	Jerry Lee	SW. ¼ of SE. ¼ and SE. ¼, SW. ¼.	2	17	1	do	Poverty.
508	do	do	24	5902	Nathan Markham	SW. ¼ of NW. ¼, NW. ¼ of SW. ¼.	14	24	5	do	Ignorance.

509	....do	....do	24	6766	John Brandenburg..	NE. ¼ of NW. ¼	12	15	2	.....do	Do.
510	....do	....do	25	6642	Christian Forgersan.	W. ½, NE. ¼	1	12	6	Residence not established in time.	Sickness.
511	Gainesville, Fla	Cash	19	4636	Sidney H. Perry	N. ½, NE. ¼	2	21	20	Conflict with school indemnity, which was canceled September 14, 1883.	
512	....do	....do	11	4622	James M. DeWitt ..	N. ½, NW. ¼	36	20	21	Land not offered	
513	Gainsville, Fla	Cash	11	4601	Samuel R. Bradley..	Lot No. 1	27	33	17	Land not offered	
514	Montgomery, Ala	Homestead	24	4793	William Riley	NW. ¼ of NE. ¼	8	13	2	Proof not made in time	Ignorance.
515	... do	....do	24, 25	1247	Nancy H. Guest ..	SE. ¼	30	7	6	....do	Do.
516	Huntsville, Ala	....do	24	2200	Dawson P. McGlathery.	NW. ¼ of SW. ¼	4	8	3	....do	Sickness.
517	Salina, Kans	....do	24	17946	F. J. Maxwell	N. ½ of NW. ¼ and N. ½ of NE. ¼.	15	20	2	....do	Ignorance.
518	....do	....do	24	17888	John Grand	E. ½ of NE. ¼	13	12	5	....do	Do.
519	Yankton, Dak	... do	24	2236	Henry C. Johnston.	SE. ¼	23	97	50	....do	Do.
520	....do	....do	24	2262	James Olin	S. ½ of SE. ¼ sec. 7, and N. ½ of NE. ¼.	18	96	48	....do	Do.
521	Springfield, Mo	.. do	24	4224	Edward Price	Lot 4, of NW. ¼	5	34	16	....do	Do.
522	La Crosse, Wis	.. do	24	7445	Kund Tarbjoureen..	SW. ¼ of NW. ¼ and NW. ¼ of SW. ¼.	34	21	6	....do	Poverty.
523	Falls of St. Croix, Wis.	....do	24	2879	John Hurley, jr	W. fractional ½ of SW. ¼	30	35	17	....do	Ignorance.
524	....do	....do	25	2881	John A. Strom	NW. ¼ of NE. ¼ and NE. ¼ of NW. ¼.	14	35	14	Residence not established in time.	Poverty.
525	Tracy, Minn	... do	25	5005	James Lowe	SE. ¼	34	107	42	....do	Do.
526	Niobrara, Nebr	....do	25	4988	Edward H. Marle...	NW. ¼	29	30	4	....do	Sickness.
527	....do	....do	24	3266	William Krause	W. ½ of NW. ¼ sec. 5, and N. ½ of NE. ¼.	6	29	5	Proof not in time	Ignorance.
528	Grand Island, Nebr	....do	24	6507	William R. Jolls	W. ½ of NW. ¼	24	15	8	....do	Do.
529	La Crosse, Wis	....do	24	7422	Daniel R. Hadley....	SW. ¼ of NW. ¼	2	23	11	....do	Do.
530	....do	....do	24	7310	John R. Hurlburt...	SE. ¼ of SE. ¼, W. ½ of SE. ¼	25	23	12	....do	Do.
531	....do	....do	24	7305	Thom Thallefsen ...	W. ½ of NE. ¼	20	14	6	....do	Do.
532	....do	....do	24	7254	Thom Kellogg	S. ½ NE. ¼ and NE. ¼ of SE. ¼	32	22	7	....do	Do.
533	....do	....do	24	7082	John W. Worth	NE. ¼ of NW. ¼	21	9	5	....do	Do.
534	....do	....do	24	7071	Eiehl T. Oftedahl...	NW. ¼ of SW. ¼	9	13	5	....do	Do.
535	....do	.. do	24	4882	Anders Evenson....	E. ½ of SE. ¼	22	12	6	....do	Do.
536	....do	....do	24	6647	David L. H. Chase ..	NE. ¼ of SE. ¼	26	12	8	... do	Do.
537	....do	....do	24	4753	Alina Boland	E. ½ of SE. ¼	17	11	6	....do	Do.
538	....do	....do	24	6117	John Murphy	NW. ¼ of NE. ¼	21	16	3	....do	Do.
539	....do	....do	24	7035	White Bear	NE. ¼ of NE. ¼	28	22	3	....do	Do.
540	....do	.. do	24	6467	John Crullickson ...	NW. ¼ of NE. ¼	8	20	5	....do	Do.
541	Eau Clair, Wis	....do	24	3570	Alexis Sirre	W. ½ of NW. ¼ and N. ½ of SW. ¼.	1	32	7	....do	Do.
542	....do	....do	24	3622	Cyrel Maux	W. ½ of NE. ¼ and E. ½ of NW. ¼.	12	32	7	....do	Do.
543	....do	....do	24	3755	Glaude Faron	SE. ¼	1	32	7	....do	Do.
544	La Crosse, Wis	....do	24, 25	7066	Milton Owen	N. ½ of NE. ¼ / And NW. ¼ of NW. ¼	25 / 30	12 / 12	4 / 3	Proof not in time, and residence not in time.	Do.
545	....do	....do	25	6935	John Christianson..	NW. ¼ of SE. ¼ and N. ½ of SW. ¼.	32	24	8	Residence not in time	Do.
546	Eau Clair, Wis	....do	25	4818	John Fennessey	N. ½ of NE. ¼	24	26	10	....do	Sickness.

Public land cases confirmed by the Board of Adjudication during the year ended June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
547	Grand Island, Nebr.	Homestead .	25	11140	Mary A. Watts	SE. ¼	18	18	15	Residence not in time	Sickness.
548	....do	....do	25	10485	George J. Whitman	SE. ¼	17	21	12	.. do	Floods.
549	Bloomington, Nebr	....do	24	4389	H. E. Reiher	SE. ¼	10	2	11	Proof not in time	Ignorance.
550	Denver, Colo.....	....do	24	1711	William E. Neale ..	S. ½ of SE. ¼ and S. ½ of SW. ¼.	30	3	64	....do	Do.
551	Pueblo, Colo	....do	24	1432	Robert Donnelly	NE. ¼	32	11	66	....do	Do.
552	Boonville, Mo	....do	24	7423	John H. Brannon ...	SW. ¼ of SW. ¼	5	36	21	....do	Sickness.
553	Huntsville, Ala.....	....do	24	2113	Andrews W. Willis .	Fractional SW. ¼ of SE. ¼ and SE. ¼ of SW. ¼.	19	7	1	....do	Do.
554	....do	....do	24	2104	Charley Falley.....	NE. ¼	22	6	6	....do	Ignorance.
555	Montgomery, Ala...	....do	24	2116	Amos F. Farnhir ...	SE. ¼ of NW. ¼, SW. ¼ of NE. ¼, NE. ¼ of SW. ¼ and NW. ¼ of SE. ¼.	26	12	9	....do	Do.
556	Huntsville, Ala.....	... do	19	2345	George Weh.....	W. ½ of SW. ¼	8	11	2	Conflict with prior homestead entry No. 6150, canceled June 18, 1879.	
557	....do	....do	19	2128	Sarah J. McGee.....	NW. ¼ of SE. ¼, SW. ¼ of NE. ¼, E. ½ of SE. ¼.	14	9	8	Conflict with prior homestead entry No. 4707, canceled June 4, 1881.	
558	Benson, Minn.....	....do	25	7915	Benjamin Lent	NW. ¼	7	22	46	Residence not established in time.	Poverty.
559	Saint Cloud, Minn ..	Wt. location	11	114221	William Wilson	S. ½ of NW. ¼	34	133	35	Land not subject to private entry.	
560	Litchfield, Minn....	Homestead .	24, 25	6732	Herbert Mattheisen.	W. ½ of SE. ¼	18	121	40	Proof not made in time, and residence not established in time.	Ignorance.
561	Cookston, Minn.....	....do	24	1518	John B. Simmons...	SE. ¼ of NW. ¼ and lots 1 and 2.	10	138	41	Proof not made in time.....	Do.
562	Detroit, Minn	....do	20	1337	Ole Baulson, jr	W. ½ of NW. ¼	34	150	48	Had not declared his intention to become a citizen at date of entry.	
563	New Orleans, La ...	....do	24	1639	M. Mayfield	S. ½ of SW. ¼	4	19	3	Proof not made in time.....	Ignorance.
564	....do	....do	24	1643	P. Boissell	Lot No. 4	8	1	4	.....do	Do.
565	....do	.. do	24	1638	Calvin Vickors	SE. ¼ of NE. ¼ and NE. ¼ of SE. ¼.	3	23	2	.....do	Do.
566	Natchitoches, La ...	....do	24	551	William F. Ferguson	NE. ¼	25	14	10	.....do	Do.
567	Huntsville, Ala. ..	....do	24	1740	William B. Anderson	SE. ¼ of NW. ¼ and N. ½ of SW. ¼.	23	11	11	.....do	Do.
568	....do	....do	19	2375	James Bryant	SE. ¼ of NW. ¼ and NE. ¼ of SW. ¼.	22	11	2	Conflict with prior homestead entry No. 6769, canceled February 24, 1883.	

569	Boonville, Mo	do	24	3551	Nancy Webb	NW. ¼ of SW. ¼	27	41	3	Proof not made in time	Ignorance.
570	do	do	24	3553	Burgess A. Matthews	NW. ¼ of NW. ¼	13	40	4	do	Sickness.
571	Wichita, Kans	do	24	6252	Edwin R. Lowe	S. ½ of SE. ¼	14	22	2	do	Ignorance.
572	Lewiston, Idaho	do	25	229	James Rose	SE. ¼ of NE. ¼, NE. ¼ of SE. ¼.	1	41	5	Residence not established in time.	Hostile Indians.
						And lots 5 and 6	6	41	4		
573	La Crosse, Wis	do	24	7018	Ne-shum-uk-kaw	NW. ¼ of SW. ¼	34	22	3	Proof not made in time	Poverty.
574	do	do	24	7027	White Dog	SW. ¼ of SE. ¼	14	21	3	do	Do.
575	do	do	24	7028	Thomas Bear	NW. ¼ of NW. ¼	32	22	3	do	Do.
576	do	do	24	7030	Walking Cloud	NW. ¼ of NE. ¼	32	22	3	do	Do.
577	do	do	24	7033	Red Wing	SE. ¼ of NW. ¼	32	22	3	do	Do.
578	do	do	24	7034	Ha-saw-such-kaw	SE. ¼ of SW. ¼	34	22	3	do	Do.
579	do	do	24	7041	Wan-chaw-era-kaw	NE. ¼ of SE. ¼	4	21	3	do	Do.
580	do	do	24	7042	Mon-na-pa-kaw	NW. ¼ of SE. ¼	4	21	3	do	Do.
581	do	do	24	7043	Cheonan-jee-kaw	SE. ¼ of NE. ¼	14	21	3	do	Do.
582	do	do	24	7051	Dr. White	SW. ¼ of NE. ¼	8	21	3	do	Do.
583	do	do	24	7153	Thomas Jefferson	SE. ¼ of SE. ¼	24	21	3	do	Do.
584	do	do	24	6864	Thomas Karsallah	NE. ¼ of NE. ¼	2	19	10	do	Ignorance.
						And E. ½ of SE. ¼	35	20	10		
585	Wausau, Wis	do	24	692	Alfred Complive	Lots 8, 9, and 16	4	20	5	do	Do.
586	La Crosse, Wis	do	24	4992	Martin Kelley	NW. ¼ of NE. ¼ and NE. ¼ of NW. ¼.	4	15	1	do	Do.
587	do	do	24	4990	George H. Nortman	NW. ¼ of SW. ¼	6	20	4	do	Do.
588	Eau Claire, Wis	do	24	4273	Daniel Bunger	S. ½ of SE. ¼ 5 and E. ½ of NE. ¼.	8	31	8	do	Do.
589	La Crosse, Wis	do	24	7470	Joseph Binder	NE. ¼ of SE. ¼	27	13	2	do	Do.
590	Falls Saint Croix, Wis.	do	27	4200	George Gordon	S. ½ of NE. ¼	4	26	14	Proof made by a deserted wife.	
591	Eau Claire, Wis	do	27	3787	Robert Reed	E. ½ of SW. ¼	6	26	9	do	
592	La Crosse, Wis	do	25	4993	Hans Johnson	N. ½ of SW. ¼ and N. ½ of SE. ¼.	22	20	6	Residence not established in time.	Poverty.
593	Redwood Falls, Minn	do	25	1902	William Fish	S. ½ of NE. ¼	30	112	36	do	Do.
594	do	do	25	2742	Samuel D. Pumpelly	SE. ¼	14	111	46	do	Do.
595	Worthington, Minn	do	24	6683	Francis T. Graves	S. ½ of NE. ¼	26	101	41	Proof not made in time	Negligence.
596	Huntsville, Ala	do	24	2201	Martin W. Hogg	S. ½ of SW. ¼	28	6	2	do	Ignorance.
597	do	do	24	2456	John Kennemer	SW. ¼ of NW. ¼ and NW. ¼ of SW. ¼.	29	5	4	do	Do.
598	Montgomery, Ala	do	24	2748	Martha A. Calloway	E. ½ of SW. ¼, NW. ¼ of SW. ¼, SW. ¼ of NW. ¼.	35	5	27	do	Do.
599	Huntsville, Ala	do	25	1978	L. Sisp	W. ½ of SE. ¼	20	1	5	Residence not established in time.	Do.
600	Ironton, Mo	do	24	2421	Jeremiah Raash	SW. ¼ of SW. ¼	11	28	7	Proof not in time	Sickness.
						And NE. ¼ of NE. ¼	15				
601	Camden, Ark	do	24	5569	William H. C. Pace	SE. ¼ of SW. ¼	20	73	9	do	Do.
602	Beatrice, Nebr	do	25	6588	Luallen R. Coag	W. ½ of SW. ¼	34	5	4	Residence not established in time.	Negligence.
603	Fargo, Dak	do	25	7226	Frank Sheeks	NE¼	2	133	57	do	Do.
604	Gainesville, Fla	Cash	11	4779	Lawrence B. Hughey	SW. ¼ of NE. ¼	26	19	28	Land not offered	
605	Huntsville, Ala	Homestead	24	2520	Anna I. Dobbs	W. ½ of SE. ¼	33	5	12	Proof not made in time	Poverty.
606	Pueblo, Colo	do	24	1245	Winslow H. Curtis	SW. ¼ of SE. ¼, SE ¼ of SW. ¼, SW. ¼ and N. ½ of SW. ¼.	19	13	58	do	Ignorance.

Public land cases confirmed by the Board of Adjudication during the year ended June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
607	Worthington, Minn.	Homestead .	24	6696	Lorenz Deufel ...	NE. ¼ of NE. ¼	26	102	5	Proof not made in time.....	Ignorance.
608	....do	.. do	25	10966	Halvor K. Olson ...	N. ½ of NE. ¼	34	105	46	Residence not established in time.	Do.
609	Saint Cloud, Minn	....do	24	11251	True H. Movers ...	NE. ¼ of SE. ¼, SE. ¼ of NE ¼	23	133	30	Proof not made in time	Do.
610	Lewiston, Idaho	.. do	25	269	John Gilstrap.....	N. ½, SW. ¼, and S. ½ of NW. ¼.	33	39	4	Residence not established in time.	Poverty.
611	Eau Claire, Wis	....do	24, 25	3692	August Lueck.....	SW. ¼ of NE. ¼, NW. ¼ of SE. ¼.	20	26	7	Residence not established in time, and proof not in time.	Do.
612	....do	.. do	24, 25	3125	Benjamin Mitchell..	S. ½ of NE. ¼ -	11	33	8	.... do.....	Do.
613	.. do	....do	25	4192	August Schlag	E. ½ of NE ¼	6	26	8	Residence not established in time.	Sickness.
614	....do	... do	25	4255	Michael Geoghegan.	E. ½ of NW. ¼ and W. ½ of NE. ¼.	23	30	5	.....do.....	Do.
615	....do	.. do	25	4255	Max Leinung	SE. ¼ of NE. ¼.....	32	27	8	..... do.....	Poverty.
616	.. do	.. do	25	4570	John Klews	S. ½, NW. ¼, and N. ½ of SW. ¼.	1	32	11	..... do	Do.
617	.. do	.. do	20	4127	Peter Scheff	SE. ¼ of SW. ¼	2	30	1	Had not declared his intention to become a citizen at date of entry.	
618	....do	....do	24	4089	Isaac Tabor	E. ½ of SW. ¼ and SW. ¼ of SE. ¼. And N. ½ of NE. ¼	33 4	33 32	11 11	Proof not made in time.....	Poverty.
619	.. do	... do	24	3898	Alva Smith.....	Lots 4 and 5 and SW. ¼ of NE. ¼.	12	33	8	.....do.....	Do.
620	....do	....do	24	3775	Daniel Rajol.....	W. ½ of NW. ¼ and W. ½ of SW. ¼.	25	33	7	.....do	Do.
621	....do	....do	24	3674	Jacob Peter	E. ½ of SE. ¼ and SW. ¼ of SE. ¼. And NW. ¼ of SW. ¼	32 33	31	19	... do	Do.
622	....do	....do	24	3584	Laurence Bohin	SE. ¼ of NW. ¼ and SW. ¼ of NE. ¼.	14	31	10	.....do	Do.
623	....do	....do	24	3423	August Boese	W. ½ of NW. ¼, SE. ¼ of NW. ¼ and NE. ¼ of SW. ¼.	33	31	10	.....do..	Do.
624	....do	....do	24	3292	Abram Plummer..	SW. ¼ of SE. ¼, SE. ¼ of SW. ¼. And NE. ¼ of NW. ¼ and NW. ¼ of NE. ¼.	17 20	32	9	... do	Do.
625	....do	... do	24	2896	Ernest Ratz	N. ½ of NE. ¼, SE. ¼ of NE. ¼, and NE. ¼ of SE. ¼.	6	31	8	.....do.....	Do.
626	....do	....do	24	2371	L. M. Lampman	SE. ¼ of NE. ¼, N. ½ of SE. ¼, and SE. ¼ of SE. ¼.	6	32	10	.....do.....	Ignorance.

627	....do	....do	24	2327	John H. Pinnerud	E. ½ of NE ¼ And W. ½ of NW. ¼	31 32	32	10	....do		Do.
628	....do	....do	24	2379	Isaac Barber	NW. ¼	15	32	11	.....do		Do.
629	....do	....do	24	1576	Christian Larson	SE. ¼	23	34	11	.....do		Poverty.
630	Jackson, Miss	....do	24	3622	Robert J. Hopkins	S. ½ of SE. ¼ and NE. ¼ of SE. ¼. And NW. ¼ of NE. ¼	13 24	8	14	....do		Ignorance.
631	....do	....do	24	7677	Peter Brown	E. ½ of SE. ¼	19	4	14	.....do		Do.
632	... do	....do	24	2352	Douglas Hamilton	S. ½ of NW. ¼ and N. ½ of SW. ¼.	20	1	4	....do		Do.
634	... do	...do	24	2382	Edmon Carver	E. ½ of NE. ¼	31	8	14	.....do		Do.
635	....do	....do	24	5728	A. J. Robertson	E. ½, SW. ¼, SE. ¼ of NW. ¼, and NW. ¼ of SE. ¼.	35	8	16	.....do		Do.
636	.. do	....do	24	7855	A. Hemingway	E. ½ of NW. ¼	23	12	5	.....do		Do.
637	.. do	....do	24	5974	W. O. Chisholm	SE ¼ of NW. ¼, SW. ¼ of NE. ¼.	36	6	5	.....do		Do.
638	Stockton, Cal	....do	24	1871	Reuben Thompson	W. ½ of NE. ¼	30	3	10	.... do		Do.
639	Sacramento, Cal	... do	24	1837	John Buckner	NW. ¼	29	10	10	.... do		Do.
640	... do	....do	24	1799	William P. Sickles	E. ½ of SE. ¼ and NW. ¼ of SE. ¼.	6	14	7	.....do		Sickness.
641	....do	....do	24	1786	Robert L. Gimpson	S. ½ of NE. ¼	32	10	10	.....do		Do.
642	Visalia, Cal	....do	24	1575	William P. Blake	W. ½ of SE. ¼	10	21	24	.....do		Do.
643	....do	....do	24	1574	William Blake	E. ½ of SE. ¼	10	21	24	.....do		Ignorance.
644	Shasta, Cal	....do	24	442	Rob't F. Poindexter	N. ½ of SE. ¼, NE. ¼ of SW. ¼, and SW. ¼ of NE. ¼.	14	33	1	.....do		Do.
645	Susanville, Cal	....do	24	1160	David Essex	E. ½ of NE. ¼ and N. ½ of SE. ¼.	14	42	10	.....do		Negligence.
646	do	... do	24	1117	Robert Ingreen	Lots 3 and 4	25	24	17	.....do		Do.
647	Huntsville, Ala	....do	24	2618	Foster B. Perdee	E. ½ of SW. ¼	6	11	9	.... do		Ignorance.
648	....do	.. do	24	2599	Daniel J. Robinson	N. ½ of SE. ¼	18	10	7	..... do		Sickness.
649	... do	....do	24	2566	John N. Rush	E. ½ of NE. ¼, SW. ¼ of NE. ¼, NW. ¼ of SE. ¼.	12	9	10	.... do		Negligence.
650	Tracy, Minn	... do	25	5078	John Lowe	NE. ¼	34	107	42	Residence not established in time.		Poverty.
651	Huntsville, Ala	... do	24	2696	William P. Shipman	N. ½ of SW. ¼ and N. ½ of SE. ¼.	31	9	8	Proof not made in time		Negligence.
652	....do	....do	24	2898	John M. Stacks	SE. ¼ of SE. ¼, 5 and NE. ¼ of NW. ¼ and N. ½ of NE. ¼.	8	14	9	.....do		Ignorance.
653	....do	....do	24	2844	Mary A. Candle	N. ½ of SW. ¼	36	10	13	.....do		Do.
654	....do	... do	24	2669	Caleb Wyley	SW. ¼ of SE. ¼ and SE. ¼ of SW. ¼.	28	12	7	.....do		Do.
655	....do	....do	24	2820	James A. Duncan	NW. ¼ of SW. ¼	34	3	5	..... do		Do.
656	....do	....do	24	2810	James M. Mattox	E. ½ of NW. ¼	28	9	11	.... do		Do.
657	....do	....do	24	2834	John H. Everett	S. ½ of NE. ¼	32	9	8	.....do		Do.
658	... do	...do	24	2835	Samuel C. Everett	N. ½ of NW. ¼	32	9	8	.....do		Do.
659	....do	....do	24	2686	Wm. R. Cole	SE. ¼ of SE. ¼ 8 and NE. ¼ of NE. ¼.	17	10	8	.....do		Negligence.
660	....do	....do	24	2400	Daniel Guthery	NE. ¼ of SW. ¼, NW. ¼ of SE. ¼ and S. ½ of SE. ¼.	25	5	4	.....do		Do.

Public land cases confirmed by the Board of Adjudication during the year ending June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
661	Huntsville, Ala.	Homestead	24, 25	2687	Richard Otto	W. ½ of NW. ¼ 35 and E. ½ of NE. ¼.	34	13	14	Proof not made in time, and residence not established in time.	Negligence.
662	do	do	24, 25	2842	John J. Spinger	NW. ¼ of NE. ¼	3	1	9	do	Do.
663	do	do	24, 25	2683	Robert S. Dickson	S. ½ of NE. ¼	8	9	5	do	Do.
664	do	do	25, 27	2673	Sarah A. Moody	SW. ¼ of NW. ¼ and NW. ¼ of SW. ¼. SE. ¼ of NE. ¼ and NE. ¼ of SE. ¼.	33 32	5	6	A deserted wife, and residence not established in time.	Do.
665	do	do	27	2537	Lucinda N. Davidson	W. ½ of SW. ¼, SE. ¼ of SW. ¼. NE. ¼ of SE. ¼	8 7	11	7	A deserted wife makes proof.	
666	Redwood Falls, Minn	do	25	2757	August Stroshein	W. ½ of NW. ¼, SE. ¼ of NW. ¼.	28	713	39	Residence not established in time.	Do.
667	do	do	25	2752	William D. Scriver	SW. ¼ of SE. ¼	4	111	36	do	Do.
668	Worthington, Minn	do	25	6566	Ira H. Chapman	NE. ¼	26	102	47	do	Do.
669	Litchfield, Minn	do	25	6738	Andrew Olson	N. ½ of SE. ¼	8	119	42	do	Do.
670	Benson, Minn	do	24	7345	Daniel R. Willson	S. ½ of NE. ¼	10	120	33	Proof not made in time	Do.
671	Gainesville, Fla	do	24	3802	Alfred Price	E. ½ of NW. ¼	4	15	20	do	Do.
672	do	do	24	3824	Shepperd D. Hodges	S. ½ of SW. ¼, SW. ¼ of SE. ¼ and Lot 1.	14	17	33	do	Do.
673	do	do	25	3805	Joshua Waters	W. ½ of SE. ¼	27	30	25	Residence not established in time.	Poverty.
674	Salina, Kans	do	25	18554	David R. Wallace	W. ½ of SE. ¼ and S. ½ of SW. ¼.	6	15	3	do	Do.
675	Yankton, Dak	do	24	2355	Ellef Solem	S. ½ of NW. ¼ and N. ½ of SW. ¼.	3	96	54	Proof not made in time	Ignorance.
676	La Crosse, Wis	do	24	7017	Red Bird	S. ½ of SW. ¼	28	22	3	do	Do.
677	Eau Claire, Wis	do	24	3274	E. A. Butts	S. ½ of SE. ¼	6	26	6	do	Do.
678	La Crosse, Wis	do	24	4881	L. Halverson	SE. ¼ of NE. ¼, N. ½ of SE. ¼, SW. ¼ of SE. ¼.	12	24	10	do	Do.
679	do	do	24	4797	O. Gilson	NE. ¼	32	19	2	do	Do.
680	Eau Claire, Wis	do	24	2542	Daniel P. Danielson	W. ½ of SW. ¼	10	29	6	do	Do.
681	do	do	24	2531	Thomas G. Smith	S. ½ of SE. ¼	8	23	7	do	Do.
682	do	do	24	4176	Walter Knickbocker.	Lots 3 and 4	6	29	1	do	Do.
683	La Crosse, Wis	do	24	1258	William Oberhausen	NE. ¼ of SE. ¼	14	7	1	do	Do.
684	Yankton, Dak	do	24	2437	Joseph Bro	S. ½ of NE. ¼	24	90	49	do	Do.

685	....do	....do	24	2340	G. Handel	W. ½ of NW. ¼	19	97	56	....do	Do.
						E. ½ of NE. ¼	24	97	57		
686	....do	....do	24	2373	Amos Nettleton	NE. ¼ fractional ¼	4	99	49	....do	Do.
687	Boonville, Mo	....do	24	3560	William Allison	Lot 1 of NE. ¼ and NW. ¼ of SE. ¼ and NE. ¼ of SW. ¼.	4	35	17	....do	Sickness.
688	Natchitoches, La	....do	24	615	Isaac Crawford	N. ½ of SE. ¼ and S. ½ of SE. ¼	18	17	6	....do	Do.
689	Salt Lake City, Utah	....do	24	2361	William Bayliss	E. ½ of NW. ¼ and S. ½ of NE. ¼.	15	3	12	....do	Ignorance.
690	....do	....do	24	2644	James Brown	E. ½ of SW. ¼	24	12	3	....do	Do.
691	....do	....do	24	2646	Per Dash	S. ½ of NE. ¼	24	12	3	....do	Do.
692	....do	....do	24	2697	Satucq Souif	W. ½ of SE. ¼	12	11	3	....do	Do.
693	Olympia, Wash	....do	24	1677	Catharine Brooks	W. ½ of SW. ¼ 2, and E. ½ of SE. ¼.	3	35	3	....do	Do.
694	Gainesville, Fla	....do	24, 25	2827	William Patrick	NW. ¼	14	3	13	Proof not made in time, and residence not established in time.	Do.
695	...do	....do	25	3855	John H. Adams	Lots 1 and 2	21	60	40	Residence not established in time.	Do.
696	Wichita, Kans	....do	25	6244	Jonas R. Newman	N. ½ of NW. ¼	28	22	3	....do	Sickness.
697	Tracy, Minn	... do	25	5053	Albert N. Jeffers	S. ½ of NE. ¼ and N. ½ of SE. ¼.	12	107	37	....do	Negligence.
698	Dallas, Oreg	....do	19	375	Francis M. Belt	SE. ¼ of NW. ¼	26	7	17	Conflict with homestead No. 10, which was canceled December 18, 1879.	
699	....do	....do	19	128	Algera V. Horton	W. ½ of NW. ¼	26	7	17	....do	
700	Colfax, Wash T	... do	15	12	John Busher	NE. ¼ of NW. ¼	1	12	45	Excess of area excessive	
701	Marquette, Mich	Cash		11	Amos Newell Hubbard.	S. ½ of SW. ¼	26	45	7	Conflict with prior homestead 1675 canceled February 20, 1882.	
						N. ½ of NW. ¼	35				
702	Gainesville, Fla	....do	11	5416	G. H. Watts	NW. ¼ sec. 24 and NE. ¼	17	20	19	Land not offered	
703	....do	....do	11	5438	George K. Broome	Lots 1 and 2	36	31	15	....do	
704	....do	....do	11	5442	Robert B. Bridges	SE. ¼ of SW. ¼ and SW. ¼ of SE. ¼.	11	30	24	....do	
705	....do	Homestead	25	3695	Anton Zimmerman	NE. ¼	11	20	27	Residence not established in time.	Ignorance.
706	....do	....do	24	3061	Thomas Adams	N. ½ of SE. ¼	4	15	21	Proof not made in time	Do.
707	Huntsville, Ala	...do	24	2811	John D. Russell	N. ½ of NW. ¼	4	9	4	....do	Do.
708	....do	....do	24	1802	William M. Morton	W. ½ of SW. ¼	22	10	4	....do	Do.
709	....do	....do	24	2716	Taylor Telks	NE. ¼ of NE. ¼	32	12	7	....do	Do.
710	....do	....do	24	2769	Joseph N. Cannack	SE. ¼ of SW. ¼	12	5	12	....do	Do.
711	....do	....do	24	2710	John E. Graves	N. ½ of NE. ¼ and NE. ¼ of NW. ¼.	26	14	14	....do	Do.
712	... do	....do	24	2735	John R. Roberts	W. ½ of NE. ¼	10	8	10	....do	Do.
713	...do	....do	24	2437	Darcus Jones	E. ½ of NE. ¼	24	7	4	....do	Do.
714	....do	....do	24	2455	Stephen D. Kennemer.	NW. ¼ of SW. ¼ sec. 21 and NE. ¼ of SE. ¼.	20	5	4	....do	Do.
715	....do	....do	24	2792	Lucy Craig	N. ½ of SW. ¼	8	2	6	....do	Do.
716	Natchitoches, La	....do	24	624	Eliza Jane McArthur.	W. ½ of SW. ¼	34	4	4	....do	Sickness.

Public land cases confirmed by the Board of Adjudication during the year ending June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
717	Natchitoches, La ...	Homestead .	24	48	Mary L. Cole	E. ½ of SE. ¼ and SW. ¼ of SE. ¼.	24	3	9	Proof not made in time.....	Ignorance.
718	Reed City, Mich....	.. do	24	4778	Frank Canklin.....	W. fractional ½ of NW. fractional ¼.	26	16	12	.....do	Do.
719	....do	....do	25	5242	James Harris	NW. ¼ of NE. ¼ and SE. ¼ of NW. ¼, lots 1 and 2.	1	35	3	Residence not established in time.	Do. Do.
720	Eau Claire, Wis	....do	24, 25	1576	Christian Larson ...	SE. ¼.....	23	34	11	Residence not established in time, and proof not intime.	
721	Dallas, Oreg	....do	19	374	Thomas Monson....	NE. ¼ of NW. ¼	26	7	17	Conflict with prior homestead entry No. 11010 canceled December 18, 1879.	
722	La Mesilla, N. Mex..	Cash	13	54	Edwin Terrell	W. ½ of SE. ¼ and E. ½ of SW. ¼.	14	11	13	Land embraced in an Indian reservation and released February 2, 1874, but not restored to market.	
723	Natchitoches, La ...	....do	19	9670	Frederick D. Wimberly.	N. ½ of SE. ¼	32	22	10	Conflict with prior selection for railroad purposes, which was canceled May 7, 1879.	
724	Gainesville, Fla	....do	11	5474	John J. Gaudrey....	SW. ¼ of NE. ¼	25	28	15	Land not offered.....	Ignorance.
725	....do	....do	11	5475	John Flannery.....	SW. ¼ of SW. ¼ and SE. ¼ of SW. ¼.	21	29	15	.....do.....	Do.
726	... do	....do	11	5494	Mark R. Bacon.....	SE. ¼ of SW. ¼.....	5	21	29	.....do.....	Do.
727	Harrison, Ark	Homestead..	24	3899	James H. Young ..	SW. ¼ of SE. ¼	6	15	18	Proof not made in time	Do.
728	....do	....do	24	3897	Jacob J. Shook.....	SE. ¼ of SW. ¼.....	32	20	19	.....do.....	Do.
729	Huntsville, Ala.....	....do	24	2829	James A. Hanks ..	NW. ¼	17	3	3	.....do.....	Do.
730	....do	....do	24	2803	Frederick M. Herforth.	N. ½ of NE ¼	34	10	3	.....do..... ..	Poverty.
731	Yankton, Dak	....do	24	2396	Joseph Hefna	SW. fractional ¼	18	94	57	.....do.....	Do.
732	....do	.. do	24	2341	John Handel.....	NW. fractional ¼	18	97	56	.....do.....	Do.
733	....do	.. do	24	2424	Frank Kulis	SE. ¼.....	3	93	57	.....do.....	Ignorance.
734	....do	....do	24	2393	Gottfried Knispot ..	SW. ¼.....	9	97	51	.....do	Do.
735	La Crosse, Wis	. do	24	5039	Aloïs Kohlman	SE. ¼ of NE. ¼, N. ½ of SE. ¼ and SW. ¼ of SE. ¼.	22	25	12	.....do.....	Do.
736	....do	....do	24	5017	Charles Kunz.....	N. ½ of NE. ¼ and E. ½ of NW. ¼.	32	24	13	.....do.....	Do.
737	Wichita, Kans.....	.. do	24	6105	Edward Jones	E. ½ of SE. ¼.....	12	24	7	.....do.....	Do.
738	Marquette, Mich ...	....do	24	633	Urgelle Belanger ...	W. ½ of NW. ¼	12	46	24	.....do.....	Do.
739	....do	....do	24	642	Henry Cole	S. ½ of NE. ¼ and S. ½ of NW. ¼.	6	46	23	.....do.....	Do.
740	....do	....do	24	656	August Bengton ...	NW. ¼	6	38	21	.....do.....	Do.

741	....do	....do	24	675	Laurence McGraw..	SE. ¼ of NE. ¼	28	41	22	.....do	Poverty.
742	Reed City, Mich....	....do	Special.	5404	Oran M. Munro.....	SE. fl. ¼	4	37	3	Second entry, see Commissioner's letter with the papers.	
743	Worthington, Minn	....do	24	10049	Alonzo Lawton	SW. ¼ of SW. ¼	18	105	6	Proof not made in time	Ignorance.
744	Litchfield, Minn....	....do	25	6301	Culbert Haron	S. ½ of NW. ¼ 2 and N ½ of SW. ¼	10	117	27	Residence not established in time.	Poverty.
745	Camden, Ark.....	....do	24	2938	Robert Shelton ...	S. ½ of SE. ¼	25	7	28	Proof not made in time ...	Negligence.
						N. ½ of NE. ¼	36	.....	.....		
746	Harrison, Ark	... do	24	3849	Robert Boone	NE. ¼ of SE. ¼	34	16	29	.....do.....	Ignorance.
747	Huntsville, Ala.....	.. do	24	2841	William Keeton	SE. ¼ of NE. ¼	31	12	8	.....do.....	Do.
748	....do	....do	24	2849	Cynthia Vandiver ..	NW. ¼ of NE. ¼	24	12	7	.... do.....	Poverty.
749	... do	....do	24	2812	John Blackwood....	E. ½ of SE. ¼	36	9	5	.....do.....	Do.
750	... do	... do	24	2865	Peyton F. Mills	S. ½ of SE. ¼	28	9	4	.....do.....	Do.
751	... do	....do	24	2874	John J. Rouse	S. ½ of NW. ¼	4	3	3	.....do.....	Do.
752	... do	....do	24	2814	James L. Ray.....	NW. ¼ of NE. ¼	12	8	10	.....do.....	Negligence.
753	... do	....do	24	2875	Thornton Wiggins..	N. ½ of SW. ¼	12	3	4	.....do.....	Do.
754	Gainesville, Fla	Cash.....	11	5675	Edward R. Trafford.	SW. ¼ of SW. ¼	17	26	28	Land not offered	Ignorance.
755	....do	Homestead .	25	3981	Warren C. Butts....	S. ½ of NE. ¼	35	19	27	Residence not established in time.	Poverty.
756	Eau Claire, Wis	....do	25	4576	Robert Klewe	N. ½, NE. ¼, N. ½ of NW. ¼, SE. ¼ of NW. ¼	2	32	11	..... do.....	Sickness.
757	Wausau, Wis.....	... do	25	1740	John McGahan	SE. ¼ of SW. ¼, N. ½ of SE. ¼, SW. ¼ of SE. ¼	1	31	10	.....do.....	No building material in time.
758	Eau Claire, Wis	....do	25	3634	Joseph Pilkey.....	Lots 1 and 2, and NE ¼ of NW. ¼	10	30	7	.....do.....	Poverty.
759	....do	.. do	24	2808	Gottlieb Amdt.....	N. ½ of NE. ¼	32	27	6	Proof not made in time	Negligence.
760	Concordia, Kans....	....do	24	12903	O. F. Haight.....	SW. ¼	20	6	8	.....do.....	Ignorance.
761	....do	.. do	24	12821	Rhoda Newton	E. ½, NW. ¼	1	6	3	.....do.....	Do.
762	....do	....do	24	12834	Nels Nelson	NE. ¼	25	3	5	.....do.....	Do.
763	....do	....do	24	13022	Garrebt R. Nanninga.	W. ½ of NW. ¼	14	8	5	.....do.....	Do.
764	New Orleans, La....	.. do	24	1594	Joseph Wilhelmus..	Lot No. 4	32	10	8	.....do.....	Do.
765	....do	... do	24	1595	Dan'el Ulrich.....	Lot 4.....	20	10	8	.....do.....	Do.
766	Natchitoches, La ...	Warrant....	19	45508	Elizabeth Templeton	SE. ¼ of NE. ¼	32	22	10	Conflict with prior selection of State for railroad purposes canceled May 7, 1879.	
767	....do	... do	19	22431	Redding Traunud ..	SW. ¼ of NE. ¼	32	22	10	.....do.....	
768	....do	... do	19	66241	Henry Wimbuck ...	NE. ¼ of NE. ¼	32	22	10	.....do.....	
769	Eau Claire, Wis	Homestead	Special.	2512	Haviar Brandea ..	SW. ¼ of NE. ¼, SE. ¼ of NW. ¼, NE. ¼ of SW. ¼ And NW. ¼ of SE. ¼.	8	30	5	See Commissioner's letter with the case.	
770	....do	....do	..do ...	4678	James Thompson ...	NE. ¼ of NW. ¼	26	28	11	.....do.....	
771	East Saginaw, Mich.	....do	24	1392	Edward Gazette	SW. ¼	10	11	1	Proof not made in time	Ignorance.
772	Huntsville, Ala.....	....do	24	2404	Lewis Craft	S. ½, NW. ¼ and N. ½ of SW. ¼.	30	8	7	.....do.....	Do.
773	....do	....do	24	2405	Esther Downing....	E. ½ of NE. ¼	36	13	3	.....do.....	Do.
774	....do	....do	24	2131	Kinzy C. Mize	N. ½ NE. ¼	24	8	5	.....do.....	Do.
775	....do	....do	24	2192	Reddin Garrison	N. ½ NE. ¼	25	9	8	.....do.....	Do.
776	....do	....do	24	2887	Samuel Hewlett	NE. ¼ SW. ¼, SE. ¼ NW. ¼.	7	3	3	.....do.....	Do.

Public land cases confirmed by the Board of Adjudication during the year ending June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
777	Redwood, Falls, Minn.	Homestead	24	2812	Joseph Branick	N. ½ of NW. ¼, SW. ¼ of NW. ¼.	34	115	36	Proof not made in time	Ignorance.
778	Worthington, Minn.	do	24	6699	Frank Hernbd	S. ½ of SW. ¼	22	102	4	do	Do.
779	Benson, Minn	do	25	7475	Patrick Lawler	S. ½ of SW. ¼	8	122	41	Residence not established in time.	Ravages by grasshoppers.
780	Worthington, Minn.	Timber culture.	20	25	John H. Meier	W. ½ of SE. ¼	28	103	31	Had not declared his intention at date of entry.	
781	Gainesville, Fla.	Homestead	19	1317	Prince A. Johnson	W. ½ of lot 1 of NW. ¼ and NW. ¼ of SW. ¼.	4	30	25	Conflict with State selection as swamp which was rejected November 13, 1880.	
782	do	do	24	3963	Henry M. Bloom	SW. ¼ of NE. ¼ and SE. ¼ of NW. ¼.	8	4	15	Proof not made in time	Ignorance.
783	do	do	24	4014	Nancy Frink	W. ½ of SW. ¼	34	7	20	do	Do.
784	do	do	25	3997	Aaron Tomlinson	SE. ¼ of NE. ¼ And SW. ¼ NW. ¼	34 35	22	25	Residence not established in time.	Poverty.
785	Hays City, Kans	do	25	429	John H. Gerhardt	SW. ¼	8	19	16	do	Sickness.
786	do	do	24	453	John Staab	N. ½ of SW. ¼	6	13	16	Proof not made in time	Ignorance.
787	Wichita, Kans	do	24	6249	Lars Nelson	NW. ¼	2	26	7	do	Sickness.
788	La Crosse, Wis	do	24	7122	Nicholaus Weinandy	NW. ¼ of SW. ¼	4	21	12	do	Ignorance.
789	Bloomington, Nebr.	do	24	2786	Carl J. Peterson	W. ½ of SE. ¼	6	6	15	do	Do.
790	Little Rock, Ark	do	24	3547	David Phipps	NW. ¼	34	1	4	do	Do.
791	do	do	24	1303	Samuel A. Neal	E. ½ of SE. ¼ SW. ¼ of SW. ¼ And NW. ¼ of NW. ¼	23 24 25	10	13	do	Do.
792	Natchitoches, La	do	24	497	William S. Cockerham.	W. ½ of NE. ¼, S. ½ of NW. ¼.	27	12	4	do	Do.
793	La Crosse, Wis	do	24	7320	Frederick Zeutzech	SW. ¼ of SE. ¼	27	9	5	do	Do.
794	do	do	24	7186	Wm. H. Davenport	SE. ¼ of SW. ¼	21	11	6	do	Do.
795	do	do	24	7032	Pin-ke con-kaw	SW. ¼ of NW. ¼	26	22	3	do	Do.
796	do	do	24	6726	Alexander Lees	SE. ¼ of NW. ¼	25	23	11	do	Do.
797	Worthington, Minn.	do	24	6100	Sylvester Norton	W. ½ of NW. ¼ and W. ½ of SW. ¼.	6	102	44	do	Do.
798	Litchfield, Minn	do	24	6526	Syvert Severton	E. ½ of NW. ¼	24	117	39	do	Do.
799	Benson, Minn	do	24	5980	John McNally	NW. ¼	26	124	44	do	Do.
800	Alexander, Minn	do	24, 25	3353	Ervin Hall	N. ½ SE. ¼ and N. ½ SW. ¼	12	130	37	Proof not made in time and residence not established in time.	Do.
801	Benson, Minn	do	25	6065	Gustaf Wenson	NW. ¼	28	122	46	Residence not established in time.	Poverty.

802	....do	....do	25	6026	Oliver Haughey	S. ½ of NW. ¼ and NE. ¼ of NW. ¼.	10	119	39	.....do	Ravages by grasshoppers.
803	....do	....do	25	6022	Frank Stelzig	E. ½ of SE. ¼ and NW. ¼ of SE. ¼.	28	121	41	.....do	Sickness.
804	....do	....do	25	5971	Gutvine Asleson	E. ½ NW. ¼	2	119	42	.....do	Do.
805	Tracy, Minn	... do	20	5065	Charles H. Briffeth	NW. ¼ of NE. ¼ / And W. ½ of SE. ¼, NE. ¼ of SW. ¼.	7 / 6	109	45	Had not declared his intention at date of entry.	
806	New Orleans, La	....do	24	1426	Henri T. Reiner	W. ½ NW. ¼ and W. ½ of SW. ¼.	23	10	9	Proof not made in time	Ignorance.
807	....do	....do	24	1655	Jens Nielson Thistrup.	SE. ¼ of NW. ¼, NW. ¼ of SE. ¼, and N. ½ of SW. ¼.	18	11	10	.....do	Sickness.
808	Huntsville, Ala	....do	24	2173	George W. Compton	SE. ¼ of NW. ¼ and NE. ¼ of SW. ¼.	6	9	7	.....do	Do.
809	Yankton, Dak	....do	24	2445	Lars P. Larson	NW. ¼	14	95	51	.....do	Do.
810	Gainesville, Fla	....do	24	4416	Calvin Brie	NE. ¼ of SE. ¼ and SE. ¼ of NE. ¼.	30	3	4	.....do	Ignorance.
811	....do	....do	24	3809	Henry Hall	NE. ¼ of SE. ¼	28	2	9	.....do	Do.
812	....do	....do	25	4043	Luther L. Blanton	W. ½ of SE ¼	23	29	15	Residence not established in time.	Negligence.
813	Niobrara, Nebr	....do	25	1941	Richard Hill	S. ½ of SW. ¼ and N. ½ NW. ¼.	12	28	8	.....do	Do.
814	....do	....do	25	1984	Andrew W. Baldwin	E. ½ of SW. ¼ and W. ½ of SE. ¼.	12	31	10	.....do	Sickness.
815	Gainesville, Fla	Additional homestead.	Special	1691	James A. Rozell	Lot 1, being NE. ¼ of NE. ¼	7	20	27	See Commissioner's letter with the case.	
816	Saint Cloud, Minn	Cash	19	11623	John Krebsback	SE. ¼ of SE. ¼	6	723	29	Land not restored	
817	Gainesville, Fla	Homestead	25	4091	C. E. Livingston	NE. ¼ of NE. ¼ / S. ½ of SE. ¼ and NW. ¼ of SE. ¼.	5 / 32	22 / 21	30	Residence not established in time.	Negligence.
818	....do	....do	25	4092	Robert F. Tracy	Lot No. 3	6	9	22	.....do	Do.
819	....do	....do	25	4058	Edmund B. Lane	Lot 4, NW. ¼ SE. ¼ and N. ½ SW. ¼.	22	9	23	.....do	Do.
820	....do	....do	24	4089	Catherine Hubbard	W. ½ NW. ¼	22	3	5	Proof not made in time	Ignorance.
821	....do	....do	24	4060	Lancaster Stewart	SW. ¼ SE. ¼	28	1	13	.....do	Do.
822	....do	....do	24	4088	Jacob Brown	N. ½ SE. ¼	28	10	18	.....do	Do.
823	....do	....do	19	4054	William Duncan Howze.	N. ½ SW. ¼	13	31	25	Conflict with State selection, which was canceled November 13, 1880.	
824	La Crosse, Wis	... do	24	6868	John Bauer	NW. ¼	24	25	12	Proof not made in time	Ignorance.
825	....do	....do	24	7106	Joseph Vanlass	NE. ¼ NE. ¼	28	18	5	.....do	Do.
826	....do	....do	24	7064	James H. Hewey	SW. ¼ of SE. ¼ 10, and N. ½ of NE. ¼.	15	13	7	.....do	Do.
827	....do	....do	24	6010	Wilhelm Fabian	SE. ¼ of SE. ¼	33	19	6	.....do	Do.
828	....do	....do	24	5970	Ole W. Johnson	SE. ¼ of SW. ¼	20	18	7	.....do	Do.
829	Wausau, Wis	....do	24	1765	Charles N. Paine	NE. fractional ½ of NE. ¼ and S. ½ of NE. ¼.	6	21	5	.....do	Do.
830	Eau Claire, Wis	....do	24	3017	Andrew O. Jorstad	SW. ¼ of SE. ¼ and SE. ¼ of SW. ¼. / And NW. ¼ of NE. ¼ and NE. ¼ of NW. ¼.	18 / 19	32	10	.....do	Do.

Public land cases confirmed by the Board of Adjudication during the year ending June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
831	Eau Claire, Wis	Homestead .	24	3018	Nels A. Lund.....	E. ½ of NW. ¼ and E. ½ of SW. ¼.	15	32	10	Proof not made in time	Ignorance.
832	....do	....do	25	4444 4956	Nils Halversen ...	S. ½ of SW. ¼ and S. ½ of SE. ¼.	82	29	11	Residence not established in time on No. 4444.	Sickness.
833	....do	....do	25	4699	Augustus Harden ..	SE. ¼	5	32	10	Residence not established in time.	Poverty.
834	Concordia, Kans	...do	24	13096	Osborne Jenkens ...	SE. ¼	34	5	8	Proof not made in time.....	Ignorance.
835	....do	....do	24	13106	John McKee	NE. ¼	21	6	1	.....do.....	Do.
836	Yankton, Dak.....	...do	24	2454	Barbara Liger	NE. ¼	35	95	57	.....do.....	Do.
837	Montgomery, Ala ..	...do	24	2915	Noah Coleman.....	W. ½ of SW. ¼	2	21	12	.....do.....	Do.
838	Colfax, Wash	Additional homestead.	Special.	194	William J. Gibbe ..	Lot 1 and NE. ¼ of NW. ¼..	30	17	44	See Commissioner's letter with the papers.	
839	Gainesville, Fla	Homestead .	24	4100	James M. Foster ...	E. ½ of NE. ¼ and W. ½ of NE. ¼.	36	2	14	Proof not made in time.....	Poverty.
840	Montgomery, Ala...	...do	24	2942	Charles Hill	NE. ¼ of NW. ¼	14	21	12	.....do	Ignorance.
841	....do	....do	25	2959	Olive Shack	W. ½ of NW. ¼	10	22	12	Residence not in time.....	Do.
842	Huntsville, Ala	....do	25	2897	Francis C. Gummett.	E. ½ of SE. ¼.....	22	13	57	.....do.....	Do.
843	...do	... do	24	2969	Wm. T. Moore	SE. ¼.....	28	2	10	Proof not made in time . ..	Do.
844	....do	....do	24	6181	John R. McMinn ...	NW. ¼	14	11	4	.....do.....	Do.
845	Taylor's Falls, Minn.	... do	25	2445	Robert Vallert	NW. ¼	26	34	24	Residence not in time.....	Poverty.
846	Lewiston, Idaho	....do	25	322	William Sigler	SW. ¼.....	11	35	5	.....do.....	Do.
847	Eau Claire, Wis.....	.. do	24	2803	Jesse Tuttle	NE ¼	30	30	1	Proof not made in time	Ignorance.
848	Yankton, Dak	....do	24	2534	Alois Kadletc	NE. ¼	3	93	57	.....do.....	Do.
849	Fargo, Dak	.. do	25	6947	Charles H. Wilcox..	NE. ¼	14	141	54	Residence not in time.	Poverty.
850	Boonville, Mo	.. do	24	3584	Henry Heinricks ...	NW. ¼ of NE. ¼	11	43	4	Proof not made in time.....	Ignorance.
851	Grand Island, Nebr	....do	25	11242	Lizzie C. Wiseley	SW. ¼ of NW. ¼ and NW. ¼ of SW. ¼. And E. ½ of NE. ¼.....	20 19	17	16	Residence not in time	Sickness.
852	....do	....do	25	6747	Adam Neis	NW. ¼.....	18	20	9	.....do.....	Poverty.
853	Niobrara, Nebr	....do	24	1980	Charles F. T. Wittneben.	SW. ¼ of SW. ¼ ..... NW. ¼ of NW. ¼ ..... N. ½ of NE. ¼.....	21 28 29	30	4	Proof not made in time.....	Ignorance.
854	Natchitoches, La....	....do	24	2291	Edmund Collins	E. ½ of SE. ¼.....	30	16	13	.....do.....	Sickness.
855	Montgomery, Ala...	.. do	24	3411	George W. Griffin ..	W. ½ of NW. ¼	10	5	12	.....do	Ignorance.
856	....do	....do	24	2978	Tan Parker	SE. ¼ of NW. ¼ and NE. ¼ of SW. ¼.	24	16	2	.....do.....	Do.
857	....do	....do	24	2979	Newton Miller.....	SW. ¼ of NE. ¼ and NW. ¼ of SE. ¼.	24	16	2	.....do.....	Do.
858	....do	....do	24	2972	Stephen Greathouse.	NW. ¼ of NW. ¼ ..... And N. ½ of NE. ¼ and NE. ¼ of NW. ¼.	26 27	21	22	.....do.....	Do.

859	Huntsville, Ala	do	24	2986	David C. Manasco	W. ½ NE. ¼, NW. ¼ of SE. ¼	23	9	8	do	Sickness.
860	do	do	24	2906	John Oaks	NE. ¼ of SW. ¼, SE. ¼ of NW. ¼.	36	7	3	do	Do.
861	do	do	24	2907	Samuel J. Oaks	SW. ¼ of NW. ¼	6	8	2	do	Do.
862	do	do	25	3025	John W. Maxwell	E. ½ SW. ¼	10	7	2	do	Ignorance.
863	Beatrice, Nebr	do	24	4598	Nathan F. House	NE. ¼	30	4	1	Residence not established in time.	Do.
864	Niobrara, Nebr	do	24	1996	William Mendelsohn	NW. ¼	13	27	5	do	Sickness.
865	do	do	24	5514	Stephen H. Boulls	SW. ¼	21	31	13	do	Do.
866	Crookston, Minn	do	24	1596	Annie Thoreson	NE. ¼	26	145	44	do	Do.
867	Eau Claire, Wis	do	24	4116	J. E. Crawford	SW. ¼ of SW. ¼	34	26	6	do	Poverty.
868	Dardanelle, Ark	do	24	3409	Richard J. Brooks	SW. ¼ of NE. ¼	12	4	22	do	Sickness.
869	Gainesville, Fla	do	24	4128	James Hodges	SE. ¼ of SE. ¼ N. ½ NE. ¼, NE. ¼ of NW. ¼.	21 28	19	18	do	Do.
870	do	do	24	4120	James Flowers	Lot No. 4	22	3	26	Proof not in time	Ignorance.
871	do	do	24	3993	Thomas Peters	E. ½ SW. ¼, SW. ¼ of SW. ¼ And NE. ¼ of NW. ¼	22 27	20	32	do	Do.
872	do	do	24	4001	James Wright	E. ½ NW. ¼	28	13	20	do	Do.
873	Kirwin, Kans	do	24	5802	Oliver Sanford	E. ½ of NE. ¼ And NW. ¼ of NW. ¼	25 30	3 3	16 15	do	Do.
874	do	do	24	6349	Isaac Whitaker	NW. ¼	1	2	21	do	Do.
875	do	do	24	6348	Robert S. Nathaniel	SW. ¼	1	2	21	do	Do.
876	Concordia, Kans	do	24	13200	G. W. Dye	NE. ¼	33	1	6	do	Do.
877	Kirwin, Kans	do	27	6178	Dalley C. Kellogg	NW. ¼	3	6	22	A deserted wife makes proof.	
878	do	do	24	6506	Samuel J. Neuschwanger.	SE. ¼	35	7	14	Proof not made in time	Ignorance.
879	Lake City, Colo	do	20	210	Ourt Van Hogen Commuted case.	Lots 1 and 2, SW. ¼ of SE. ¼ And Lot 4	15 14	45	9	Had not declared his intention to become a citizen at date of entry.	
880	Huntsville, Ala	do	24	2925	Alexander Cannon	N. ½ of N. W. ¼ And S. ½ of SW. ¼	20 17	3	5	Proof not made in time	Sickness.
881	do	do	24	2961	Mathew Psorn	W. ½ of NW. ¼	12	3	4	do	Negligence.
882	do	do	24	2968	James S. Burke	NE. ¼ of SE. ¼	18	7	6	do	Do.
883	do	do	24	3017	Patient Wilhits	S. ½ SE. ¼	26	8	4	do	Ignorance.
884	do	do	24	2916	Wm. H. Daniel	NE. ¼ of SW. ¼	28	2	10	do	Do.
885	do	do	24	6601	Daniel G. Avery	SW. ¼	13	10	13	do	Do.
886	Montgomery, Ala	do	24	2982	William Hobbs	E ½ of SE. ¼ and E ½ of NE. ¼	30	4	8	do	Do.
887	do	do	24	3002	Josephus Livingston.	SE. ¼ of NE. ¼, E. ½ of SE. ¼ NW. ¼ of SW. ¼	22	23	12	do	Do.
888	do	do	24	3011	Emma O. Thompson	NE. ¼	28	3	3	do	Do.
889	do	do	24	3016	Samuel J. Steed	NE. ¼ of SE. ¼	14	15	2	do	Do.
890	do	do	25	3012	Andrew J. Beam	S. ½ of NW. ¼, SW. ¼ of NE. ¼ And NE. ¼ of SW. ¼	31	17	12	Residence not established in time.	Sickness.
891	Natchitoches, La	do	24	18	David Bamhill	E. ½ of NE. ¼	30	18	14	Proof not made in time	Poverty.
892	East Saginaw, Mich	do	24	1400	Rudolph Bomke	SE. ¼ of NE. ¼ and NE. ¼ of SE. ¼.	18	24	2	do	Do.
893	Marquette, Mich	do	24	575	Peter Schipley	W. ½ of NW. ¼	14	38	23	do	Do.
894	East Saginaw, Mich	do	25	1433	Samuel Revell	NW. fractional ¼	2	25	2	Residence not established in time.	Storms.
895	do	do	25	1396	Daniel S. Waldron	SE. ¼	6	25	2	do	No building material in time.

Public land cases transferred by the Board of Adjudication during the year ending June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
896	Gainesville, Fla	Homestead	24	3718	March Stevens	SE ¼ of NW. ¼	34	7	19	Proof not made in time	Poverty.
897	do	do	24	3685	Julius Halsey	Lot 7	22	11	18	do	Ignorance.
898	Eau Claire, Wis	do	24	2545	William Roycroft, jr.	SW. ¼ of NE. ¼ and SE. ¼ of NW. ¼.	26	28	8	do	Do.
899	La Crosse, Wis	do	24	7176	Daniel Cox	SE. ¼ of NW. ¼	29	12	3	do	Do.
900	Yankton, Dak	do	24	2561½	Joseph Kociam	NW. ¼	2	93	57	do	Do.
901	Worthington, Minn	do	24	6724	Eunice P. Emerson	NW. ¼	28	102	43	do	Do.
902	Redwood Falls, Minn	do	25	1782	Nils Henrickson	N. ½ of NE. ¼	2	115	38	do	Poverty.
903	Eau Claire, Wis	do	24	2855	Henry Dumke	NE. ¼ of SE. ¼ Sec. 7, N. ½ of SW. ¼ and SE. ¼ of NW. ¼.	8	31	8	do	Negilgence.
904	Kirwin, Kans	do	27	6476	Sarah C. Smail	W. ½ of NW. ¼, SE. ¼ of NW. ¼ and NE. ¼ of SW. ¼.	2	6	22	A deserted wife makes proof.	
905	San Francisco, Cal	do	24	2298	George W. C. Huntley.	S. ½ SW. ¼	28	13	16	Proof not made in time	Ignorance.
						NE. ¼ of NE. ¼	32				
						NW. ¼ of NW. ¼	33				
906	Sacramento, Cal	do	24	1893	Anne Buckley	E. ½ of NW. ¼ and N. ½ of SW. ¼.	22	7	15	do	Do.
907	do	do	24	1891	Henry Obermeyer	SW. ¼ of SW. ¼	19	8	15	do	Do.
						N. ½ of NW. ¼ and NW. ¼ of NE. ¼.	30				
908	do	do	24	1860	Antonio Garibaldi	SW. ¼ of NW. ¼	30	6	12	do	Do.
909	do	do	24	1853	Asa S. Camp	SW. ¼ of NW. ¼ and NW. ¼ of SW. ¼.	22	11	11	do	Do.
910	do	do	24	1824	Charles C. Ragsdale	W. ½ of SW. ¼	28	14	8	do	Do.
911	Stockton, Cal	do	24	1484	Natale Giordon	W. ½ of SE. ¼, SE. ¼ of SE. ¼	31	2	16	do	Do.
912	San Francisco, Cal	do	24	2607	Wesley Burnett	N. ½ of SW. ¼	22	26	10	do	Do.
913	Susanville, Cal	do	24	1043	Wm. Coppersmith	SE. ¼ of SW. ¼, SW. ¼ of SE. ¼.	10	38	17	do	Do.
						And NE. ¼ of NW. ¼ and NW. ¼ of NE. ¼.	15				
914	Sacramento, Cal	do	24, 25	1108	Gustav Haupt	W. ½ of SW. ¼	34	5	11	Proof not made in time and residence not established in time.	Do.
						W. ½ of NW. ¼	3	4	11		
915	Visalia, Cal	do	24	1609	Joseph Riley	W. ½ of NW. ¼	10	19	23	Proof not made in time	Do.
916	do	do	24	2221	William Brannen	W. ½ of SW. ¼	22	23	25	do	Do.
917	Jackson, Miss	do	24	2383	Miles Davis	SE. ¼ of NE. ¼	28	25	5	do	Do.
918	do	do	24	7930	Michael Harrison	SE. ¼ of NE. ¼	18	2	1	do	Do.
919	do	do	24	7951	Anderson Colton	W. ½ of NE. ¼	23	14	16	do	Do.
920	La Crosse, Wis	do	24	7349	Byron Pickering	E. ½ of SE. ¼, SW. ¼ of SE. ¼	10	23	1	do	Do.
921	do	do	24	7507	Wm. W. McFarland	E. ½ of SE. ¼	12	23	2	do	Do.

922	....do	....do	24	7391	Nathan Smith	SE. ¼ of SW. ¼	33	10	4	.....do	Do.
923	Eau Claire, Wis	....do	25	4559	William Gibbs	W. ½ of SW. ¼	31	23	8	Proof not made in time and residence not established in time.	Sickness.
924	.. do	....do	25	4133	Simon Emmerson	S. ½ of NE. ¼, NW. ¼ of SE. ¼, NE. ¼ of SW. ¼.	23	32	11	.....do	House burned.
925	....do	....do	20	3264	Canute Lucas	S. ½ of SE. ¼	14	40	1	Had not declared his intention to become a citizen of the United States at date of entry.	
926	Niobrara, Nebr	....do	25	2017	Dayton Ward	NE. ¼ of NE. ¼	25	30	4	Residence not established in time.	Ignorance.
						N. ½ of NW. ¼, SE. ¼ of NW. ¼.	30	30	5		
927	Montgomery, Ala	....do	24	3015	James M. Nix	E. ½ of SE. ¼	14	19	10	Proof not made in time	Do.
						NW. ¼ of SW. ¼ and SW. ¼ of NW. ¼.	13				
928	....do	....do	24	3058	Andrew Jefferson	SE. ¼ of SE. ¼	9	1	3	.....do	Do.
929	....do	....do	25	3076	Silas M. Wiatt	W. ½ of NE. ¼	7	24	21	Residence not established in time.	Sickness.
930	.. do	....do	24	3177	George Reed	S. ½ of SE. ¼	28	4	1	Proof not made in time	Ignorance.
931	... do	....do	24	3176	William Reed	N. ½ of SE. ¼	28	4	1	.....do	Do.
932	....do	.. do	24	3131	Stephen Johnson	E. ½ of SW. ¼ and S. ½ of SE. ¼.	30	15	3	.....do	Do.
933	....do	....do	24	3129	William Morris	Fractional M	33	10	28	.....do	Negligence.
934	.. do	....do	24	3082	Henry Jones	SW. ¼ of SW. ¼	36	18	13	.... do	Ignorance.
935	.. do	do	24	3147	Phillip Hayes	SW. ¼ of NE. ¼	23	14	4	.. do	Do.
936	... do	....do	24, 25	3173	John Gilley	SE. ¼	28	3	24	Proof not made in time and residence not in time.	Do.
937	....do	....do	24, 25	3126	William L. Johnson	NW. ¼ of NE. ¼ and NE. ¼ NW. ¼.	36	13	7	.....do	Do.
938	....do	....do	24, 25	3122	Benjamin L. Harris	S. ½ of NE. ¼	9	3	27	.....do	Poverty.
939	Redwood Falls, Minn	....do	24	2477	Gustav Lind	S. ½ of SW. ¼	28	112	30	Proof not made in time	Negligence.
940	Benson, Minn	....do	25	6078	Lars M. Trene	NE. ¼	21	123	46	Residence not in time	Poverty.
941	Crookston, Minn	....do	24	1693	Annie Haggberg	Lots 6 and 7	6	139	41	Proof not made in time	Ignorance.
942	Neligh, Nebr	....do	25	4601	John E. Hultquest	NW. ¼	26	23	7	Residence not in time	Sickness.
943	Gainesville, Fla	... do	24	4250	Charles Tomblin	S. ½ of SE. ¼	30	11	15	Proof not made in time	Ignorance.
944	do	....do	24	2767	William Moss	NW. ¼ of NE. ¼	28	10	18	.....do	Do.
945	.. do	....do	24	4247	Cesar Augustus	Lot 2 and SW ¼ of NW. ¼	22	3	26	.....do	Do.
946	.. do	....do	24	4254	Emmanuel Pope	E. ½ of SE. ¼	4	4	11	.....do	Do.
947	....do	....do	24	1076	W. J. Mott	NE. ¼ of NW. ¼, SW. ¼ of NE. ¼.	7	19	26	.....do	Do.
948	Roseburg, Oreg	....do	24	1785	Yeby Harwick	N. ½ of NE. ¼ and W. ½ of SE. ¼.	19	39	2	.....do	Do.
949	Des Moines, Iowa	....do	24	2278	W. C. Ralston	E. ½ of SE. ¼	12	90	32	.....do	Insanity.
950	Olympia, Wash	....do	24, 25	2659	Silas Smith	SE. ¼ SW. ¼ and W. ½ of SE. ¼ and SE. ¼ of SE. ¼.	28	20	6	Proof not made in time and residence not in time.	Negligence.
951	Yankton, Dak	....do	24	2615	Ole Ellingeson	NE. ¼ of SW. ¼, W. ½ of Lot 1, NE. of Lot 1, NW. ¼.	2	92	53	Proof not made in time	Ignorance.
952	....do	....do	24	2600	Michael Hieb, jr	N. ½ of SE. ¼	30	95	60	.....do	Do.
						And N. ½ of SW. ¼	29				

Public land cases confirmed by the Board of Adjudication during the year ending June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
953	Yankton, Dak	Homestead	24	2599	Michael Hieb, sr.	S. ½ of SE. ¼ And S. ½ of SW. ¼	30 29	95	60	Proof not made in time	Ignorance.
954	La Mesilla, N. M.	Cash	19	69	Wm. E. Anderson	NE. ¼ of SE. ¼ E. ½ of SE. ¼, NW. ¼ of SE. ¼, SW. ¼ of NE. ¼, W. ½ of SW. ¼, and SE. ¼ of NW. ¼. SW. ¼ of SW. ¼ NE. ¼ of NE. ¼ S. ½ of SE. ¼, NW. ¼ of SE. ¼, E. ¼ of SW. ¼, E. ½ of NW. ¼, and Lots 1, 2, and 4.	7 8 9 28 31	11	13	Land not subject to private entry.	
955	Olympia, Wash	Homestead	24	1789	Jim Yonderpump	Lot 2 and SW. ¼ of NE. ¼	32	25	6	Proof not made in time	Ignorance.
956	Redwood Falls, Minn	do	24	2862	Wilhelm Birth	S. ½ of NE. ¼	34	113	32	do	Do.
957	do	do	25	2614	Michael Seeland	N. ½ of NW. ¼	28	114	41	Residence not established in time.	Do.
958	Gainesville, Fla	do	24	4272	Jeremiah Camley	Lot No. 2 of fractional	28	5	30	Proof not made in time	Do.
959	do	do	24	4271	Epsy Boyd	SW. ¼ of NE. ¼	30	2	14	do	Do.
960	do	do	24	4264	Iverson Davis	N. ½ of NW. ¼	4	14	20	do	Do.
961	Hays City, Kans	do	25	688	Jared Metz	SE. ¼	2	17	20	Residence not established in time.	Do.
962	do	do	25	2052	David T. Petty	SW. ¼	15	16	23	do	Do.
963	La Crosse, Wis	do	24	7560	John Kern	N. ½ of SW. ¼	21	22	12	Proof not made in time	Do.
964	Bayfield, Wis	do	24	83	Wm. Wiedenkoft	NW. ¼	26	41	1	do	Do.
965	do	do	25	82	Carl Thomas	E. ½ of NE. ¼	12	41	1	Proof not made in time and residence not established in time.	Poverty.
966	La Crosse, Wis	do	24	5100	William Scholl	SE. ¼ of NE. ¼	33	10	4	Proof not made in time	Negligence.
977	Eau Claire, Wis	do	24	3084	Nils Thompson	NW. ¼ of NE. ¼	24	31	11	do	Do.
968	Yankton, Dak	do	24	2689	Jacob Liedle	W. ½ of SW. ¼ W. ½ of NW. ¼	14 23	95	56	do	Sickness.
969	do	do	24	2652	Gabriel D. Mabee	SW. ¼	2	99	53	do	Ignorance.
970	Fargo, Dak	do	24	1363	Lars Morteneen	S. ½ of SW. ¼	28	141	49	do	Do.
971	Leadville, Colo	Cash	11	893	David F. Miller	SE. ¼ of SW¼, S. ½ of NE. ¼, SW. ¼ and N. ½ of SE. ¼ of NW. ¼. And SW. ¼ of NE. ¼	2 11	10	77	Land not offered	
972	Helena, Mont	do	Special	1325	Alexander Metzel	N. ½ of SW. ¼	31	7	4	See Commissioner's letter with the case.	
973	Saint Cloud, Minn	Additional homestead	15	9925	Philetus Kuhn	Lot 3, Sec. 30, 47.28, and NE. ¼ of SW. ¼.	21	143	25	Excess of area allowed	

974	...do	...do	15	9937	Caleb E. Hare	NE. ¼ of NE. ¼, Sec. 14, SE. ¼ of SW. ¼.	2	50	24	...do		
975	...do	...do	15	9892	George W. Healey	NW. ¼ of SE. ¼	3	142	26	...do		
976	...do	...do	15	9924	John N. Frazee	SW. ¼ of NW. ¼	1	142	26	...do		
						NW. ¼ of SW. ¼	28	149	26			
						SW. ¼ of SE. ¼	35	143	26			
977	...do	...do	15	9915	Frank Gilk	SE. ¼ of NE. ¼	18	143	26	...do		
978	...do	do	15	4202	Leon Faille	Lot No. 2	33	143	25	...do		
979	Fargo, Dak	Homestead	25	4012	Richard R. Griffing	SE. ¼	2	139	65	Residence not established in time.	Poverty.	
980	Sacramento, Cal	...do	24	185	Daniel D. Thrasher	SE. ¼ of SW. ¼ and SW. ¼ of SE. ¼.	20	15	18	Proof not made in time	Ignorance.	
981	...do	...do	24	1954	Jacob Stucke	SE. ¼ of SW. ¼ and SW. ¼ of SE. ¼ E. ½ of NW. ¼.	29	9	11	...do	Do.	
982	Shasta, Cal	...do	24	464	James W. Hahnan	S. ½ of SW. ¼	34	26	4	...do	Do.	
983	Marysville, Cal	...do	24	1406	Thomas H. Harlan	Lots 9–16 of SE. ¼	8	15	4	...do	Do.	
						And lots 1 and 8 of NE. ¼	17					
984	Jackson, Miss	...do	24	4491	James W. L. Woods	NW. ¼ of SW. ¼	10	12	8	...do	Do.	
985	...do	...do	24	1058	James Brisco	NE. ¼ of SW. ¼ Sec. 26, and NW. ¼ of NE. ¼.	35	17	6	...do	Do.	
986	...do	...do	24	1597	Monroe Green	Lots 3 and 4	6	6	3	...do	Do.	
987	...do	...do	24	1628	Wm. A. L. Smith	E. ½ SW. ¼, SW. ¼ of SW. ¼, sec. 33, SE. ¼ of SE. ¼.	32	10	18	...do	Do.	
988	...do	...do	24	1629	Samuel Griffin	NE. ¼	15	21	3	...do	Do.	
989	...do	...do	24	1654	Moses McGowen	E. ½ SW. ¼ and W. ½ SE. ¼	20	3	10	...do	Do.	
990	...do	...do	24	1667	G. W. Conn	SE. ¼ of SW. ¼ sec. 19, NE. ¼ of NW. ¼.	30	8	10	...do	Do.	
991	...do	...do	24	1670	Thomas Smith	SW. ¼ NE. ¼. W. ½ of SE. ¼, and NE. ¼ of SE. ¼.	18	8	10	...do	Do.	
992	...do	...do	24	1676	Lucien Coevas	N. ½ NW. ¼	30	7	13	...do	Do.	
993	...do	...do	24	1677	Alexander M. Autry	S. ½ NE. ¼, Sec. 29, and S. ½ of NW. ¼.	28	9	20	...do	Do.	
994	...do	...do	24	1680	Anderson Burton	N. ½ of SE. ¼, SE. ¼ of SE. ¼ sec. 17, and NE. ¼ of NE. ¼.	20	9	20	...do	Do.	
995	...do	...do	24	1687	Jacob Roberts	SE. ¼	22	10	17	...do	Do.	
996	...do	...do	24	1710	Geo. Myers	S. ½ SW. ¼, sec. 6, and N. ½ of NW. ¼.	7	8	19	...do	Do.	
997	...do	...do	24	1713	Milley Gibson	E. ½ SW. ¼ and SE. ¼ of NW. ¼.	31	10	16	...do	Do.	
998	...do	...do	24	1717	E. T. Tadlock	W. ½ of NE. ¼ and W. ½ of SE. ¼.	19	5	8	...do	Do.	
999	...do	...do	24	1721	Vesta A. Breland	E. ½ SE. ¼ and NW. ¼ of SE. ¼.	14	1	10	...do	Do.	
1000	...do	...do	24	1738	James T. Cooper	NE. ¼ of NE. ¼	23	5	6	...do	Do.	
1001	...do	...do	24	1740	Arthur D. Fleming	E. ½ SW. ¼ and SW. ¼ of SE. ¼.	21	7	16	...do	Do.	
1002	...do	...do	24	1758	William Harp	NE. ¼	32	10	16	...do	Do.	
1003	...do	...do	24	1764	James A. Crosby	NW. ¼ of NW. ¼, sec. 29, E. ½ of NE. ¼, NW. ¼ of NE. ¼.	30	18	4	...do	Do.	
1004	...do	...do	24	1783	Chas. Parks	SW. ¼ of SE. ¼	15	2	9	...do	Do.	
1005	...do	...do	24	1790	Augustus Pillow	E. ½ of NW. ¼, NW. ¼ of NE. ¼, and NE. ¼ of SW. ¼.	30	4	9	...do	Do.	

Public land cases confirmed by the Board of Adjudication during the year ending June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
1006	Jackson, Miss	Homestead	24	2148	Seaborn Whatley	N. ½ SW. ¼	11	18	3	Proof not made in time	Ignorance.
1007	do	do	24	2178	John Brown	NW. ¼ of NW. ¼	25	7	15	do	Do.
1008	do	do	24	2228	Ellis Sibley	W. ½ of NE. ¼	12	4	8	do	Do.
1009	do	do	24	2355	Jas. N. Bishop	S. ½ SW. ¼, S. ½ of SE. ¼	29	1	4	do	Do.
1010	do	do	24	2376	Vaul Lee	S. ½ SW. ¼	15	6	3	do	Do.
1011	Huntsville, Ala	do	24, 25	3143	John Willis	S. ½ SE. ¼	10	6	12	Proof not in time and residence not established in time.	Sickness.
1012	do	do	24	667	William A. Musgrove	NE. ¼ of NW. ¼	7	14	12	Proof not in time	Poverty.
1013	do	do	24	3062	Ephraim C. White	SW. ½ of SE. ¼	23	4	12	do	Ignorance.
1014	do	do	25	1951	William T. Nelson	NE. ¼ of SW. ¼, NW. ¼ of SW. ¼.	18	7	12	Residence not established in time.	Sickness.
1015	do	do	24	3006	Charlotte Compton	SE. ¼	25	9	8	Proof not made in time	Do.
1016	do	do	24	3034	Caroline White	NE. ¼ of SW. ¼	18	2	4	do	Do.
1017	do	do	24	3056	John F. Lenox	E. ½ NW. ¼	8	6	1	do	Do.
1018	do	do	24	3066	Edward Maples	E. ½ SW. ¼	36	2	3	do	Negligence.
1019	do	do	24	3022	George W. Hilton	NE. ¼ of SE. ¼, SE. ½ of NE. ¼.	12	11	8	do	Sickness.
1020	do	do	24	3108	Anderson Deshazo	E. ½ of NW. ¼	4	14	4	do	Do.
1021	do	do	24	3118	Joseph W. Barton	S. ½ SW. ¼, Sec. 5, and N. ½ of NW. ¼.	8	11	9	do	Ignorance.
1022	do	do	24	3052	Jas. and Riley Johnson.	SE. ¼	26	9	3	do	Do.
1023	do	do	24	3104	David M. Davis	S. ½ NW. ¼	33	12	9	do	Do.
1024	do	do	24	3111	Jas. D. Henson	N. ½ NE. ¼, SW. ¼ NE. ¼, and SE. ¼ of NW. ¼.	17	8	10	do	Do.
1025	do	do	24	3092	David D. Ford	SE. ¼ of SW. ¼ and SW. ¼ of SE. ¼.	34	7	2	do	Do.
1026	do	do	19	289	William Tobin	NE. ¼	20	10	2	Conflict with prior homestead entry No. 5287, which was canceled July 16, 1877.	Do.
1027	Montgomery, Ala	do	24	3184	David Whitson	NE. ¼ of NE. ¼	20	17	10	Proof not made in time	Do.
1028	do	do	24	3191	John H. Bayler	NE. ¼ of NW. ¼	17	9	7	do	Do.
1029	do	do	24	1803	Calvin Glass	S. ½ of NW. ¼	6	18	1	do	Do.
1030	do	do	24	2063	Andrew J. Vines	NE. ¼ of SW. ¼ and E. ½ of NW. ¼	15	17	6	do	Do.
1031	do	do	24	2605	Geo. M. Bridges	S. ½ of SE. ¼	2	19	5	do	Do.
1032	do	do	24	3197	Scott Smith	S. ½ of NE. ¼	30	11	9	do	Do.
1033	do	do	24	3218	Moses Watkins	NE. ¼ of NE. ¼	6	19	4	do	Do.
1034	do	do	24	3224	Margaret Pate	Fraction A and B	20	22	3	do	Do.

1035	....do	....do	24	3230	William H. Hollingsworth.	SE. ¼ of SW. ¼	8	13	7	.....do		Do.
1036	... do	....do	24	3232	Joseph Henderson	E. ½ SW. ¼ and W. ½ SE. ¼	14	2	10	.... do		Do.
1037	... do	....do	24	3256	James Johnson	E. ½ of SE. ¼	21	3	3	.... do		Do.
1038	Yankton, Dak	....do	24	2725	Michael Chelnoske	NE. ¼	37	95	58	.....do		Do.
1039	... do	... do	24	2733	Margaretha Rempp	E. ½ SE. ¼ S. ½ of SW. ¼	34 35	95	55	.....do		Do.
1040	Taylor's Falls, Minn.	... do	24, 25	1982	Angus McDonald	SW. ¼ of NW. ¼	28	37	21	Proof not made in time and residence not established in time.		Do.
1041	Tracey, Minn	....do	24	5129	Carl Pantzke	W. ½ SE. ¼	14	109	34	Proof not made in time		Do.
1042	Gainesville, Fla	....do	24	4301	Mary Wiggins	W. ½ of NE. ¼	32	11	15	.....do		Poverty
1043	....do	....do	24	4300	Stepney Howard	E. ½ of NE. ¼	32	11	15	.....do		Do.
1044	... do	....do	24	4292	Calvin F. Scarbrough.	Lot 3, or W. ½ of SE. ¼	24	10	26	.....do		Do.
1045	do	..do	24	4339	Joseph Peyton	E. ½ of NE. ¼	30	11	15	.....do		Ignorance.
1046	....do	....do	24	4170	Silvia Lipscomb	N. ½ of NE. ¼	8	15	21	.....do		Do.
1047	... do	do	24	4190	Calvin E. Rourk	NE. ¼ of NW. ¼	8	7	19	.....do		Sickness.
1048	La Crosse, Wis	....do	24	4348	Christian Ammdsen.	N. ½ of SE. ¼	13	22	10	.....do		Negligence.
1049	....do	....do	24	7287	William Bennett	NE. ¼ of SW. ¼ and NW. ¼ of SE. ¼.	24	23	4	.....do		Ignorance.
1050	....do	....do	24	6836	James McBurney	N. ½ of NW. ¼	20	24	4	.....do		Do.
1051	....do	....do	24	6629	Moses Bonham	S. ½ of NE. ¼ and S. ½ of NW. ¼.	28	11	3	.....do		Do.
1052	Eau Claire, Wis	....do	20, 25	3912	Maxim Sapeen	E. ½ of NE. ¼	10	25	8	Proof not made in time and residence not established in time.		Do.
1053	Wausau, Wis	....do	20	1540	James Nelson	N. ½ of SW. ¼	6	31	8	Had not declared his intention at date of entry.		Do.
1054	Huntsville, Ala	....do	24	2667	Isam G. Guthery	W. ½ of SW. ¼	34	13	9	Proof not made in time		Do.
1055	....do	....do	24	1328	Jesse P. Robert	NE. ¼ of SW. ¼ and NW. ¼ of SE. ¼.	22	8	4	.....do		Do.
1056	...do	.. do	24	3454	Samuel Miner	SW. ¼ of NE. ¼	20	6	4	.....do		Do.
1057	....do	....do	24	2652	William R. Smith	SE. ¼ of SW. ¼ and SW. ¼ of SE. ¼. NE. ¼ of NW. ¼ and NW. ¼ of NE. ¼.	5 8	10	11	.....do		Poverty.
1058	....do	....do	25	405	John Mitchell	W. ½ NW. ¼	28	9	1	Residence not established in time.		Ignorance.
1059	....do	....do	25	404	William E. Anderson	E. ½ of NW. ¼	28	9	1	.....do		Do.
1060	....do	....do	24	5116	Bunel M. Tolesom	N. ½ of SW. ¼ and S. ½ of NW. ¼.	30	11	14	Proof not made in time		Do.
1061	....do	....do	24	3115	Pierce L. Tatum	NW. ¼ of NW. ¼ NE. ¼ of NE. ¼	28 29	6	4	.....do		Do.
1062	Fergus Falls, Minn	....do	Special.	2939	Elizabeth Pearson	S. ½ of SW. ¼ and NE. ¼ of SW. ¼.	10	130	46	See Commissioner's letter herewith.		
1063	Menasha, Wis	....do	..do	544	Heirs of Alfred Penree.	N. ½ of NW. ¼	5	30	22	.....do		
1064	Montgomery, Ala	....do	24	3207	Richard Gullett	SE. ¼ of SE. ¼	3	11	7	Proof not made in time		Do.
1065	....do	....do	24	3301	Elizabeth M. Quinn	NW. ¼ of SW. ¼	4	23	9	.....do		Do.
1066	....do	....do	24	3308	James J. Coble	W. ½ of SE. ¼ and E. ½ of SW. ¼.	24	9	1	.....do		Poverty.

Public land cases confirmed by the Board of Adjudication during the year ended June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.	Reason assigned for failure.
1067	Montgomery, Ala...	Homestead .	24	3309	John W. Rayfield...	W. ¼ of SW. ¼	26	24	17	Proof not made in time.....	Poverty.
1068	.. do	....do	24	3311	Jesse Wright	N. ½ of NE. ¼	26	18	2	.....do.....	Sickness.
1069	....do	....do	24	3314	Sally Boler.....	W. ½ of NE. ¼, NW. ¼ of SE. ¼, and SE. ¼ of NW. ¼.	32	8	6	.....do.....	Ignorance.
1070	....do	....do	24	3318	Luke Nail	W. ½ of SW. ¼.	36	15	4	.....do.....	Sickness.
1071	....do	....do	24, 25	3335	Silas M. Waldrop ...	NE. ¼ of SW. ¼	2	16	14	Proof not made in time and residence not established in time.	Poverty.
1072	....do	....do	24	3368	John T. Glover ...	SE. ¼ of SW ¼, S. ½ of SE. ¼..	8	5	29	..Proof not made in time.....	Ignorance.
						NE. ¼ of NE. ¼	17				
1073	....do	....do	24	3372	Azariah S. Waldrop.	NW. ¼ of NE. ¼	4	22	12	.....do.....	Do.
1074	....do	....do	24	3374	Henry Kelly.....	N. ½ of SW. ¼, S. ½ of NW. ¼	31	6	8	.....do.....	Do.
1075	....do	....do	24	3376	Floyd Pierce.....	W. ½ of NW. ¼.	28	3	4	.....do.....	Do.
1076	....do	....do	24	3394	Reubin Curry	W. ½ of NE. ¼, E. ½ NW. ¼..	29	11	9	.....do.....	Poverty.
1077	....do	....do	24, 25	3371	Samuel Maniac	S. ½ NE. ¼ and N. ½ of SE. ¼.	1	3	4	Proof not made in time and residence not established in time.	Do.
1078	Gainesville, Fla.....	....do	24	4093	Christopher C. Higginbotham.	E. ¼, NW. ¼, SW. ¼ of NE. ¼, NW. ¼ of SE. ¼.	11	18	25	Proof not made in time.....	Ignorance.
1079	Grand Island, Nebr.	....do	24	3655	Jemima Brock	NE. ¼	26	15	11	.....do.....	Do.
1080	Yankton, Dak	....do	25	2696	Isaak Lowen	N. ½ NE. ¼	21	100	53	Proof not made in time and residence not established in time.	Sickness.
						N. ½ NW. ¼	22				
1081	Eau Claire, Wis . ..	....do	25	3099	John O. Strum.....	N. ½ NW. ¼	18	31	10	Residence not established in time.	Poverty.
1082	La Crosse, Wis	... do	24	7328	Joseph Schwarizer..	W. ½ SE. ¼	6	13	1	Proof not made in time	Ignorance.
1083	....do	....do	24	6291	Daniel McDernivid .	S. ½ NW. ¼ and N. ½ of SW. ¼	13	23	6	.....do.....	Do.
1084	Eau Claire, Wis ...	....do	24	4301	Louis Roy	E. ½ NE. ¼	34	30	1	.....do.....	Do.
1085	Worthington, Minn.	....do	24	10459	Tobias Aanenson ...	SW. ¼	4	101	45	.....do.....	Do.
1086	Benson, Minn.....	....do	25	3939	John Keenan	SW. ¼	26	116	44	Residence not established in time.	Do.
1087	....do	....do	25	7627	Benj. F. Chaffee...	Lot 5	11	122	46	.....do.....	Poverty.
						SW. ¼ of SW. ¼ and lot 6 ..	12				
1088	....do	....do	24	7518	Paul Feytek	NE. ¼ of SW. ¼ and lot 3	18	120	41	Proof not made in time	Ignorance.
1089	Jackson, Miss	....do	24	2400	George Fairby.....	E. ½ SW. ¼	25	8	18	.....do.....	Do.
1090	....do	....do	24	2401	James R. Watson...	SE. ¼ NW. ¼.	30	8	16	.....do.....	Do.
1091	....do	....do	24	2407	Frank Pounds	S. ½ SW. ¼, SW. ¼ of SE. ¼	19	2	9	..... do.....	Do.
092	....do	....do	24	2413	John Speights	N. ½ NW. ¼	17	7	19	.....do.....	Do.
1093	Gainesville, Fla.....	....do	24	4431	Charles L. Stewart..	NE. ¼ NW. ¼	5	27	37	.....do.....	Do.

1094	....do	....do	24	4422	Albert Tenney	N. ½ of SW. ¼ and E. ½ of SW. ¼.	7	21	29	.....do	Do.
1095	....do	....do	24	4418	Solomon Graham	W. ½ NW. ¼	2	4	13	.....do	Do.
1096	Huntsville, Ala	....do	24	4553	John H. York	S. ½ of NW. ¼ and N. ½ of SW. ¼.	1	12	9	.....do	Do.
1097	..do	....do	24	3195	Nathaniel M. Smith	W. ½ SE. ¼	7	11	8	.....do	Poverty.
1098	La Crosse, Wis	....do	24	6967	John B. Larigue	NW. ¼ NE. ¼	26	12	8	.....do	Ignorance.
1099	.. do	....do	24	6689	Erik G. Hestnes	S. ½ SE. ¼	19	12	5	.....do	Do.
1100	....do	....do	24	7376	Klaus Thorson	NW. ¼ of NE. ¼	30	24	11	.....do	Do.
1101	....do	... do	24	7548	August Wesenberg	S. ½ of NE. ¼	6	23	1	.....do	Do.
1102	Yankton, Dak	....do	24	2791	Julia Bryngulson	NE. ¼ fractional ¼	2	97	49	.....do	Do.
1103	Crookston, Minn	... do	24	1532	Alexander Mathewson.	W. ½ of S. E. ¼, SW. ¼ of NE. ¼, and lot 1.	10	137	42	.....do	Do.
1104	Fergus Falls, Minn	....do	24	3521	Jennie Heg	E. ½ NW. ¼	20	125	41	.....do	Do.
1105	Jackson, Minn	..do	25	4219	Arnold O. Hooda	SW. ¼	12	101	35	Residence not established in time.	Poverty.
1106	Benson, Minn	....do	25	7641	Jens Nelson	S. ½ NE. ¼	8	123	39	.....do	Do.
1107	Crookston, Minn	....do	25	1496	Hamilton Anderson	SE. ¼	24	142	46	.....do	Do.
1108	San Francisco, Cal	....do	Special.	1442	John T. Smith	S. ½ of SW. ¼, NW. ¼ of SW. ¼.	23	10	23	See Commissioner's letter with the case returned June 20, not confirmed.	
1109	Saint Cloud, Minn	....do	..do ...	4240	John W. Bennett	NW. ¼ of SE. ¼ section 22 and NW. ¼ of NE. ¼.	8	133	35	.....do	
1110	Duluth, Minn	... do	. do ...	782	Benj. F. Patterson	E. ½ SE. ¼	15	59	20	... do	
1111	Benson, Minn	....do	20	6120	Theodore Mattheisen.	NE. ¼	20	121	41	Had not declared his intention to become a citizen at date of entry.	
1112	Yankton, Dak	....do	19	2748	J. Henboldt	SW. ¼	13	97	57	In conflict with prior homestead entry No. 651, which was canceled September 1, 1877.	
1113	Roseburg, Oreg	....do	19	1025	V. E. Akin	Lots 2, 3, 4, and SW. ¼ of NE. ¼.	35	26	4	In conflict with prior homestead entry No. 3005, which was canceled September 4, 1878.	
1114	San Francisco, Cal	....do	24	2337	Edward White	N. ½ of SW. ¼	26	5	1	Proof not made in time	Ignorance.
1115	Bodie, Cal	....do	24	150	Charles A. Walter	Lot 2 fractional NE. ¼ and lot 2 fractional NW. ¼.	6	13	35	.....do	Do.
1116	Stockton, Cal	....do	24	338	Guiseppe Rosasco	Fractional NE. ¼	4	2	13	.....do	Do.
1117	....do	....do	24	839	Stephen G. Rosasco	SE. ¼	4	2	13	.....do	Do.
1118	....do	....do	24	1519	Francis Jasper	Fractional NE. ¼	2	2	16	.....do	Do.
1119	Jackson, Miss	... do	24	2463	William N. Haggard	NW. ¼ of SW. ¼	23	14	14	..... do	Do.
1120	....do	....do	24	2459	Hammett Terrell	NE. ¼ of SW. ¼, W. ½ of SW. ¼.	18	7	17	.....do	Do.
						SE. ¼ of SE. ¼	13	7	18		
1121	....do	....do	24	2457	George Morris	SE. ¼ of SW. ¼	18	10	7	.. ..do	Do.
1122	....do	....do	24	2421	George Myers	N. ½ of SW. ¼	8	8	19	.....do	Do.
1123	....do	....do	24	2420	Isaac Butler	W. ½ of SE. ¼ and S. ½ NE. ¼	21	7	20	.....do	Do.
1124	....do	....do	24	2409	Abraham Spinks	W. ½ of NE. ¼	12	9	15	.... do	Do.
1125	....do	....do	24	2396	Stephen T. Dampier	N. ½ of NW. ¼	26	10	20	.....do	Do.

Public land cases confirmed by the Board of Adjudicatian during the year ending June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Town.	Range.	Cause of suspension.	Reason assigned for failure.
1126	Jackson, Miss	Homestead	24	2465	Mary A. Hemphill	SE. ¼ SW. ¼; NW. ¼ NE. ¼ and NE. ¼ of NW. ¼.	22; 27	14	14	Proof not made in time	Ignorance.
1127	do	do	24	2468	Christopher McLeod	W. ½ NE. ¼ and E. ½ NE. ¼	30	7	17	do	Do.
1128	do	do	24	2485	James Jackson	NW. ¼ SW. ¼	25	7	15	do	Do.
1129	do	do	24	2488	William H. Waller.	E. ½ SW. ¼	9	7	19	do	Do.
1130	Gainesville, Fla	do	24	4442	Oliver H. Tenney.	W. ½ NE. ¼ and NW. ¼ of SE. ¼; SW. ¼ of SE. ¼	17; 8	21	29	do	Do.
1131	do	do	24	4440	James Scott	E. ½ of NW. ¼	6	13	22	do	Do.
1132	do	do	24	4438	Jacob Robinson	NW. ¼ of NW. ¼	6	3	27	do	Do.
1133	do	do	24, 25	4439	James Sikes	N. ½ of SE. ¼, SW. ¼ of SE. ¼, SE. ¼ of SW. ¼.	19	34	17	Proof not made in time and residence not established in time.	Do.
1134	Huntsville, Ala	do	24	3172	Jeptha V. Spinkle	NE. ¼ of NE. ¼; NW. ¼ of NW. ¼; S. ½ of SW. ¼	33; 34; 27	13	11	Proof not made in time	Do.
1135	do	do	24	3154	Richard Compton	NW. ¼ of NW. ¼; SW. ¼ of SW. ¼	7; 6	9	7	do	Do.
1136	Oregon City, Oreg	do	24	1797	Emerson H. Parker.	SE ¼	4	2	4	do	Do.
1137	Fergus Falls, Minn	do	25	4454	Amedeus B. Laird	SE. ¼	5	125	47	Residence not established in time.	Do.
1138	Yankton, Dak	do	25	2792	Gottlieb Delzer	W. ½ of NE. ¼ and W. ½ of SE. ¼.	23	99	57	Proof not made in time	Do.
1139	Falls of Saint Croix, Wis.	do	24	4118	James Hart	NW. ¼ of NW. ¼	36	34	15	do	Negligence.

N. C. McFARLAND, *Commissioner.*

Compared by Mr. J. A. Brown and Miss M. B. Moon.

[Abrtract of suspended mineral cases adjudicated by the Commissioner of the General Land Office, and his adjudication submitted for the approval and confirmation by the Secretary of the Interior and Attorney-General, under sections 2450–2457, United States Revised Statutes, and act of February 27, 1877]

Abstract number.	R. & R. No.	Name of claimant.	Name of claim.	Description.	District and State.	Docket number.	Cause of suspension.
6	186 187 188	Oro Blanco Mining Company.	Normand Franco-American Louise	Lots Nos. 41 42 43	Tucson, Ariz	5634 5646 5647	Applications for patents not sworn to in the land district.
7	1593	Forest Queen Mining Company.	Forest Queen Lode Claim.	Lot No. 745	Leadville, Colo	6228	Entry allowed during pendency of suit.
8	1	Franklin Pottery Company.	Montague Lode Claim	Lot No. 37	Huntsville, Ala	4583	Failure to publish notice sixty days.
9	1480	Roxabell Consolidated Mining Company.	Ontario Lode	Lot No. 2660	Leadville, Colo	5913	Failure to post plat and notice on claim sixty days, covered by publication.
10	1464	A. Jackson et al	Emancipation Lode Claim.	Lot No. 420	Central City, Colo		Failure to post notice in land office sixty days, covered by publication.
11	1761	Iron Silver Mining Company.	Porphyry Lode Claim	Lot No. 3075	Leadville, Colo	7012	Entry allowed during the pendency of a suit.
12	410	James H. Smith et al	Silver Coin Lode Claim	Lot No. 131	Lake City, Colo	4419	Entry allowed during pendency of adverse claim.
13	448	N. J. Bradsley et al	Harvey Lode Claim	Lot No. 182	do	4706	Entry allowed during pendency of suit.
14	1243	A. W. Zem et al	Hanlan	Lot No. 1860	Leadville, Colo	5083	Failure to post notice on claim sixty days, covered by period of publication.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE, *November* 19, 1884.

N. C. MCFARLAND, *Commissioner.*

Public land cases confirmed by the Board of Adjudication during the year ending June 30, 1884—Continued.

[Abstract of suspended pre-emption cases adjudicated by the Commissioner of the General Land Office, and his adjudication submitted for the approval and confirmation by the Secretary of the Interior and Attorney-General, under sections 2450 and 2457, United States Revised Statutes, and act of February 27, 1877, for the year ending June 30, 1884.]

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.
1	Florence, Ariz	1	Special case.	C. E. 152	Walter L. Vail	S. ½ of SE. ¼ ..... NW. ¼ of NE. ¼ and NE. ¼ of NW. ¼.	21 28	19 S.	17 E.	Entry based upon a second filing, submitted as a special case under instructions of Secretary's letter of July 6, 1884.
2	Humboldt, Kans	1	15	2105	Ira S. Clark	E. ½ of NW. ¼	18	34 S.	12 E.	Pre-emption affidavit antedates the entry; land in hands of an innocent purchaser.
3	Kickapoo, Kans	1	1	1115	Fred. J. E. Meyer	Lot 3 of NE. ¼	1	8	22	Pre-emption affidavit lost in transmission; party to entry cannot be found.
4	Grand Forks, Dak	1	20	1727	Benj. Johnson	SW ¼	29	158	51 W.	Declaration of intention to become a citizen made subsequent to filing.
5	do	1	20	1783	George Hughes.	SE. ¼	17	151	54	Do.
6	do	1	20	1808	Arcaduse Collette	W. ½ SE. ¼, NE. ¼ SE. ¼, and SW. ¼ NE. ¼.	13	157	52	Do.
7	do	1	20	1883	Geo. W. Lemon	W. ½ NW. ¼, NE. ¼ NW. ¼, and NW. ¼ NE. ¼.	10	158	53	Do.
8	do	1	20	1896	Johann S. Hallsson	S. ½ SE. ¼, NW. ¼ SE. ¼, and SW. ¼ NE. ¼.	13	161	56	Do.
9	do	1	20	2221	Ole S. Hogan	SW. ¼	34	149	54	Do.
10	do	1	20	2236	Ingeberg O. Lindelin	SE. ¼	24	157	54	Do.
11	do	1	20	2321	John Tholin	NE. ¼	27	152	55	Do.
12	do	1	20	2391	Arch. Stephens	SW. ¼	33	160	55	Declaration of intention to become a citizen made subsequent to filing; not confirmed; such action deemed unnecessary.
13	do	1	20	2403	Peter S. Evanson	NE. ¼	35	149	54	Declaration of intention to became a citizen made subsequent to filing.
14	do	1	20	2611	Ellen Colson	NE. ¼	18	150	53	Do.
15	do	1	20	2660	Godlib Lane	SW. ¼	30	149	52	Do.
16	do	1	20	2688	Wm. J. McHoffie	SE ¼	34	153	54	Do.
17	do	1	20	2760	Lester Olmstead	NE. ¼	8	154	52	Do.
18	Fargo, Dak	1	20	3442	Fred. G. Cram	NW. ¼	10	138	57	Do.
19	do	1	20	3713	Halquin E. Braaten	SW. ¼	28	134	49	Do.
20	do	1	20	3721	Ole O. Jeone	SE. ¼	2	146	54	Do.
21	do	1	20	3728	George Steand	NW. fractional. ¼	30	136	57	Do.
22	do	1	20	3731	Ole J. Holte	Lots 1, 2, 3, and 4	4	143	49	Do.
23	do	1	20	3735	Adolph W. Nelson	NE. ¼	22	139	59	Do.
24	do	1	20	3748	Ham. Galchutt	SE. ¼	22	134	49	Do.
25	do	1	20	3740	John A. Cysewski	SE. ¼	4	141	43	Do.
26	Helena, Mont	1	Special case.	908	John Anderson	W. ½ NW. ¼ and NW. ¼ SW. ¼	24	7 N.	9 W.	Do.

27	Grand Forks, Dak..	1	....do	2268	John Wright.....	SE. ¼	33	151 N.	54 W.	Do.
28	...do	1	...do	2628	Betsey Johnson.....	E. ½ NE. ¼	7	157	14	Do.
29	West Point, Nebr..	1	1	{W. & L. No. 5099}	Sherman Kimberlin...	SW. ¼.....	30	19 N.	9 E.	Pre-emption affidavit missing.
30	Kirwin, Kans	1	Special case	2002	Jacob D. Thompson...	E. ½ NE. ¼.....	33	6 S.	9 W.	Entry based upon a second filing; warrant location upon first filing, but suspended. Claimant not being able to furnish proof required, abandoned the land, and afterward, without his knowledge, the location was approved and patented, but he has never derived any benefit therefrom.
31	Stockton, Cal	1	15	{W. & L. No. 448}	Henry Stronk.....	N. ½ NW. ¼	11	9 S.	17 E.	{No proof by entryman; none obtainable; land owned by innocent purchaser.
32	Grand Forks, Dak..	1	20	2391	Arch. Stephens.....	SW. ¼	33	160	55	Declaration of intention made subsequent to filing.
33	....do	1	20	3039	Duncan Shaw.....	S. ½ SE. ¼	25	157	55	Do.
34	Roseburg, Oreg	1	Addit'l 20	4143	John Wenge.....	SW. ¼.....	24	29 S.	13 W.	Party unable to furnish record evidence of naturalization, and declared his intention to become a citizen subsequent to entry.
35	Mitchell, Dak.....	1	Special case	5986	John Hanley	SW. ¼.....	21	111	62 W.	Declaration of intention made subsequent to filing.
36	Cheyenne, Wyo....	1	do	81	John Keane.....	E. ½ SW. ¼	34	16	17	Claimant is an alien born, and came to the United States during minority, but performed no act under the naturalization laws until after he made entry.
37	Jackson, Mo	1	15	{W. & L. No. 1899}	Jackson Arnold.....	S. ½ SW. ¼ and NW. ¼ SW. ¼	14	22 N.	1 E.	{Location does not cover land filed for; original claimant cannot be reached; land in hands of a third party.
38	Vermillion, Dak...	1	Special case	1220	Joseph Marrett.....	NE. ¼ NW. ¼..... ..	17	90	48	Proof of citizenship or declaration of intention wanting; land in hands of innocent purchaser.
39	Mitchell, Dak.....	1	...do.....	7710	Geo. Baumester.....	NW. ¼	21	106	54	Claimant declared his intention to become a citizen subsequent to filing.
40	....do	1	do.....	7737	Peter A. Frastad	NE. ¼	1	103	71	Do.
41	....do	1	....do.....	7765	Thos. H. Cox.....	S. ½ NE. ¼ and S. ½ NW. ¼ .	1	103	72	Do.
42	....do	1	....do.....	7896	Jane Caesar.....	E. ½ NW. ¼ and E. ½ SW. ¼...	7	103	68	Do.
43	....do	1	....do,.....	7907	Erick L. Ihl	NE. ¼	2	105	56	Do.
44	....do.....	1	....do.....	7950	Charles Napens.....	NE. ¼.....	13	104	57	Do.
45	....do.....	1	....do.....	7995	Peter Rechtfertig.....	SE. ¼.....	8	101	66	Do.
46	....do.....	1	....do.....	8093	Andrew J. Vofed.....	NE. ¼.....	21	104	58	Do.
47	....do.....	1	....do.....	8134	James P. Luby	NW. ¼	33	107	54	Do.
48	....do.....	1	....do.....	8272	Charles Maschek	NW. ¼	30	102	59	Do.
49	....do.....	1	....do.....	8377	Paulus Clinemyer....	SW. ¼.....	32	105	54	Do.
50	...do.....	1	....do	8418	James W. Bruce.....	{SW. ¼ SE. ¼ and SE. ¼ SW. ¼ NW. ¼ NE. ¼ and NE. ¼ NW. ¼	{29 32}	103	66	Do.
51	...do.....	1	....do..... .	8437	John M. Hansis.....	NE. ¼.....	3	103	59	Do.
52	...do	1	....do.....	8453	John Riedmeller.....	NE. ¼	25	105	55	Do.
53	....do.....	1	....do.....	8458	Chris Christianson ...	NE. ¼	12	106	57	Do.
54	...do	1	....do.....	8464	Robert W. Morris	SW. ¼.....	17	105	56	Do.
55	...do	1	....do.....	8621	William Perkins.....	SE. ¼.....	25	107	57	Do.

Public land cases confirmed by the Board of Adjudication during the year ending June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.
56	Mitchell, Dak	1	Special case	8778	Hugh McConnell	NW. ¼	21	103	54	Claimant declared his intention to become a citizen subsequent to filing.
57	do	1	do	8781	Vandelin Kautman	NW. ¼	21	102	66	Do.
58	do	1	do	8687	James McFeeters	SE. ¼	33	107	60	Do.
59	do	1	do	8864	Henry A. Forcht	SW. ¼	2	108	62	Do.
60	do	1	do	8878	Patrick Hohecy	NE. ¼	9	102	61	Do.
61	do	1	do	8934	Patrick E. Rowan	SE ¼	35	108	59	Do.
62	Watertown, Dak	1	do	2514	Archibald Comer	SW. ¼	33	114	43	Do.
63	do	1	do	3100	George Washtoak	SW. ¼	23	116	55	Do.
64	do	1	do	2134	Julia A. Bakke	N. ½ SE. ¼	10	123	57	Do.
65	do	1	do	3168	Elihu Adams	SW. ¼	21	115	54	Do.
66	do	1	do	3189	Bessie S. Swan	SW. ¼	17	122	59	Do.
67	Fargo, Dak	1	1	373	Ole Tideman	NW. ¼ SE. ¼	4	136	50	Claimant filed for 120 acres. Proved upon and entered 40 acres, and at the same time made homestead entry for remaining 80 acres upon which his house was located. The homestead entry has been commuted and patented. Claimant cultivated the entire 120 acres. In making cash entry he acted on advice of local officers.
68	Batesville, Ark	1	6	8006	William H. Lane	E. ½ NE. ¼ and SE. ¼ NW. ¼	36	17 N.	3 W.	Entry covers non-contiguous tracts. Claimant did not reside on either tract. It is illeged that party made entry as an adjoining farm entry under then existing laws.
69	do	1	6 and 15	8427	Laban L. Parks	NE. ¼ NW. ¼ and NE. ¼ NE. ¼ / SE. ¼ SW. ¼ and SE. ¼ SE. ¼	29 / 22	11 N.	6 W.	Claimant did not reside on tracts entered. Land in hands of an innocent purchaser. Tracts not contiguous
70	Bloomington, Nebr.	1	Special case.	1616	Peter Johanson	E. ½ NW. ¼	12	5	14	Declaration of intention made subsequent to filing.
71	do	1	do	1632	Joseph W. Moll	N. ½ SE. ¼ and S. ½ NE. ¼	15	4	21	Do.
72	Watertown, Dak	1	do	2038	George Cernay	N. ½ SW. ¼	4	120	50	Do.
73	do	1	do	2082	Martha Svarstad	W. ½ SE. ¼	4	122	62	Do.
74	do	1	do	2121	William Kanaly	SE. ¼	30	125	61	Do.
75	do	1	do	2210	Daniel Bell	NE. ¼	8	120	62	Do.
76	do	1	do	2323	Henry J. Williams	SE. ¼	22	124	62	Do.
77	do	1	do	2457	Daniel A. McNab	NE. ¼	12	118	64	Do.
78	do	1	do	2488	Michael Schreiner	NE. ¼	2	129	52	Do.
79	do	1	do	2655	Charles H. Clayton	NW. ¼	4	129	52	Do.
80	do	1	do	2864	William E. Purcell	S. ½ NW. ¼ and N. ½ SW ¼	7	129	52	Do.

81	....do	1	....do	2868	Charles K. Vache	NW. ¼	21	129	48		Do.
82	....do	1	....do	2909	Frederick Brown	SE. ¼	1	129	52		Do.
83	....do	1	....do	3121	Frank W. Ferchtinger	S. ½ NE. ¼, NE. ¼ SW. ¼, and NW. ¼ SE. ¼.	6	129	52		Do.
84	... do	1	....do	3171	James Henry Wilcox	N. ½ NE. ¼ and N. ½ NW. ¼	15	129	52		Do.
85	....do	1	....do	3822	Henry Cughan	SW. ¼	4	129	52		Do.
86	Mitchell, Dak	1	....do	6663	Hugh S. McGillvary	W. ½ SW. ¼	30	107	60	}	Do.
						E. ½ SW. ¼	25	107	61		
87	....do	1	....do	6680	Asle E. Kelley	SW. ¼	19	109	51		Do.
88	....do	1	.. do	6751	Cary E. Solberg	SE. ¼	10	107	64		Do.
89	... do	1	....do	6752	Rasmus C. Solberg	NE. ¼	15	107	64		Do.
90	....do	1	....do	6753	Ole C. Solberg	W. ½ SW. ¼, SE. ¼ SW. ¼, and SW. ¼ SE. ¼.	1	106	64		Do.
91	....do	1	....do	6936	John W. Nichol	E. ½ SE. ¼	30	110	48		Do.
92	Fargo, Dak	1	....do	3682	Matthias Retterath	NE. ¼	23	130	52		Do.
93	....do	1	....do	3875	John Elm	NE. ¼	22	138	59		Do.
94	... do	1	....do	3876	Ole K. Stee	SW. ¼	4	143	59		Do.
95	.. do	1	.. do	3886	John T. Johnson	SW. ¼	20	145	53		Do.
96	... do	1	....do	3915	William Taggart	SE. ¼	14	142	54		Do.
97	....do	1	....do	3942	Lars G. Johnson	NW. ¼	20	145	53		Do.
98	....do	1	....do	3959	Fletcher Turner	SE. ¼	22	141	64		Do.
99	Grand Forks, Dak	1	....do	2299	Hugh Longhead	W. ½ NW. ¼, NE. ¼ NW. ¼, and NW. ¼ NE. ¼.	17	157	55		Do.
100	....do	1	....do	3178	David Lane	NW. ¼	35	160	55		Do.
101	....do	1	....do	2858	Henry Anderson	NE. ¼	5	156	54		Do.
102	....do	1	....do	2872	Peter Anderson	SE. ¼ SW. ¼	2	157	53		Do.
103	... do	1	....do	3076	Edd Wheeler	NW. ¼	34	152	55		Do.
104	... do	1	....do	3452	Mary A. Maynard	N. ½ SW. ¼, SW. ¼ SW. ¼, and NE. ¼ SE. ¼.	3	152	55		Do.
105	....do	1	....do	3462	Hans A. Anderson	S. ½ SE. ¼, NE. ¼ SE. ¼, and SE. ¼ NE. ¼.	3	158	56		Do.
106	....do	1	... do	3535	Ole Thompson	S. ½ SE. ¼, NW. ¼ SE. ¼, and SW. ¼ NE. ¼.	23	159	56		Do.
107	....do	1	....do	3526	Thom. Oleson	NE. ¼	26	159	56		Do.
108	.. do	1	....do	3613	Bernard Kemper	SW. ¼	24	157	56		Do.
109	... do	1	....do	3623	Ingeberg G. Monnak	N. ½ SW. ¼	29	158	54		Do.
110	....do	1	....do	3629	Halvor Tarkelson	SE. ¼	4	166	54		Do.
111	....do	1	....do	3679	Gudnumder Johannesson.	N. ½ SW. ¼ and N. ½ SE. ¼	10	160	56		Do.
112	.. do	1	....do	3698	Kurst A. Hegle	SE. ¼	5	156	56		Do.
113	....do	1	....do	4128	Robert Coburn	SE. ¼	32	164	56		Do.
114	....do	1	....do	4208	Henry W. Healy	NE. ¼	1	159	53		Do.
115	....do	1	....do	4309	George W. Healy	NE. ¼	25	160	53		Do.
116	Deadwood, Dak	1	....do	155	John W. Thomas	W. ½ NW. ¼	20	6 N.	3 E.		Do.
117	Watertown, Dak	1	....do	3447	Nels G. Steere	NW. ¼	1	114	57		Do.
118	....do	1	....do	3369	John Train	SE. ¼	22	116	58		Do.
119	Grand Forks, Dak	1	.. do	5207	Frederick Shultz	W. ½ NW. ¼ and W. ½ SW. ¼	13	160	51		Do.
120	....do	1	....do	5245	Alexander Fletcher	SW. ¼	21	159	52		Do.
121	....do	1	....do	5327	Thomas Killey	S. ½ SE. ¼ 10, and S. ½ SW. ¼	11	156	52		Do.
122	....do	1	... do	5356	Mary Ann Hunt	SW. ¼ SE. ¼	19	157	54		Do.
123	....do	1	....do	5395	Gisli Eyloffson	SE. ¼	33	161	55		Do.
124	Huron, Dak	1	....do	246	Charles A. Seymour	NW. ¼	12	110	63		Do.

Public land cases confirmed by the Board of Adjudication during the year ending June 30, 1884—Continued.

No.	Office.	Class.	Rule.	R. & R. No.	Names of parties.	Parts of section.	Section.	Township.	Range.	Cause of suspension.
125	Huron, Dak	1	Special case.	475	John H. Miller	NE. ¼	11	118	62	Declaration of intention made subsequent to filing.
126	do	1	do	346	Detlef Strellner	NE. ¼	8	112	66	Do.
127	do	1	do	523	Duncan Clunas	NW. ¼	26	119	62	Do.
128	Leadville, Colo	1	do	532	Thomas L. Shirley	NW. ¼ of SW. ¼ 11 and SE. ¼ of NE. ¼.	10	11	80	Original entry included 160 acres; 80 acres canceled; leaving two tracts, non-contiguous, special case.
129	Mitchell, Dak	1	do	7897	John B. Oswald	SW. ¼	27	105	56	Declared his intention to become a citizen subsequent to filing declaratory statement.
130	Watertown, Dak	1	do	3425	Andrew E. Osby	SW. ¼	35	101	54	Do.
131	Grand Forks, Dak.	1	do	3849	Robert B. Laing	SE. ¼	1	161	55	Do.
132	Huron, Dak	1	do	587	David Carr	SE. ¼	23	115	64	Do.
133	do	1	do	596	Albert Shaw	SW. ¼	13	111	63	Do.
134	do	1	do	630	Agnes Smith	NW. ¼	19	112	61	Do.
135	do	1	do	634	Thomas D. Jessop	NW. ¼	25	119	62	Do.
136	do	1	do	644	Anton Janish	SE. ¼	1	110	63	Do.
137	Colfax, Wash	1	19	779	Laura R. Labrie	SW. ¼	32	25	41	Filing made upon land covered by an uncanceled entry.

N. C. McFARLAND, *Commissioner.*

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. DOC. No. 14.

INTERNATIONAL CONFERENCE.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING

A communication from the Secretary of State, relative to International Conference held at Washington.

DECEMBER 4, 1884.—Referred to the Committee on Appropriations and ordered to be printed.

To the House of Representatives:

I transmit herewith a communication from the Secretary of State submitting the text, in the English and French languages, of the proceedings of the International Meridian Conference, provided for by the act of Congress, approved August 3, 1882, held at Washington during the month of October, 1884.

CHESTER A. ARTHUR.

EXECUTIVE MANSION,
Washington, December 4, 1884.

To the President:

The Secretary of State, under the auspices of whose Department the International Meridian Conference, provided for by the act of Congress approved August 3, 1882, was held in Washington during the month of October, 1884, has the honor to submit the text of the proceedings of the Conference in the English and French languages.

FRED'K T. FRELINGHUYSEN.

DEPARTMENT OF STATE,
Washington, December 3, 1884.

INTERNATIONAL CONFERENCE

HELD AT WASHINGTON

FOR THE PURPOSE OF FIXING

A PRIME MERIDIAN AND A UNIVERSAL DAY.

OCTOBER, 1884.

PROTOCOLS OF THE PROCEEDINGS.

INTERNATIONAL MERIDIAN CONFERENCE

HELD IN THE

CITY OF WASHINGTON.

I.

SESSION OF OCTOBER 1, 1884.

The delegates to the International Meridian Conference, who assembled in Washington upon invitation addressed by the Government of the United States to all nations holding diplomatic relations with it, "for the purpose of fixing upon a meridian proper to be employed as a common zero of longitude and standard of time-reckoning throughout the globe," held their first conference to-day, October 1, 1884, in the diplomatic hall of the Department of State.

The following delegates were present:

On behalf of Austria-Hungary: Baron Ignatz von Schæffer, envoy extraordinary and minister plenipotentiary.

On behalf of Brazil: Dr. Luiz Cruls, director of the Imperial Observatory of Rio Janeiro.

On behalf of Colombia: Commodore S. R. Franklin, U. S. N., superintendent U. S. Naval Observatory.

On behalf of Costa Rica: Mr. Juan Francisco Echeverria, civil engineer.

On behalf of France: Mr. A. Lefaivre, minister plenipotentiary and consul-general; Mr. Janssen, of the Institute, director of the Physical Observatory of Paris.

On behalf of Germany: Baron H. von Alvensleben, envoy extraordinary and minister plenipotentiary.

On behalf of Great Britain: Capt. Sir F. J. O. Evans, royal navy; Prof. J. C. Adams, director of the Cambridge Observatory; Lieutenant-General Strachey, member of the Council of India; Mr. Sandford Fleming, representing the Dominion of Canada.

On behalf of Guatemala: M. Miles Rock, president of the Boundary Commission.

On behalf of Hawaii: Hon. W. D. Alexander, surveyor-general; Hon. Luther Aholo, privy counsellor.

On behalf of Italy: Count Albert de Foresta, first secretary of legation.

On behalf of Japan: Professor Kikuchi, dean of the scientific department of the University of Tokio.

On behalf of Mexico: Mr. Leandro Fernandez, civil engineer; Mr. Angel Anguiano, director of the National Observatory of Mexico.

On behalf of Paraguay: Capt. John Stewart, consul-general.

On behalf of Russia: Mr. C. de Struve, envoy extraordinary and minister plenipotentiary; Major-General Stebnitzki, imperial Russian staff; Mr. J. de Kologrivoff, conseiller d'état actuel.

On behalf of San Domingo: Mr. M. de J. Galvan, envoy extraordinary and minister plenipotentiary.

On behalf of Salvador: Mr. Antonio Batres, envoy extraordinary and minister plenipotentiary.

On behalf of Spain: Mr. Juan Valera, envoy extraordinary and minister plenipotentiary; Mr. Emilio Ruiz del Arbol, naval attaché to the Spanish legation; Mr. Juan Pastorin, officer of the navy.

On behalf of Sweden: Count Carl Lewenhaupt, envoy extraordinary and minister plenipotentiary.

On behalf of Switzerland: Col. Emile Frey, envoy extraordinary and minister plenipotentiary.

On behalf of the United States: Rear-Admiral C. R. P. Rodgers, U. S. N.; Mr. Lewis M. Rutherfurd; Mr. W. F. Allen, secretary railway time conventions; Commander W. T. Sampson, U. S. N.; Prof. Cleveland Abbe, U. S. Signal Office.

On behalf of Venezuela: Señor Dr. A. M. Soteldo, chargé d'affaires.

The following delegates were not present:

On behalf of Chili: Mr. Francisco Vidal Gormas, director of the hydrographic office; Mr. Alvaro Bianchi Tupper, assistant director.

On behalf of Denmark: Mr. Carl Steen Andersen de Bille, minister resident and consul-general.

On behalf of Germany: Mr. Hinckeldeyn, attaché of the German legation.

On behalf of Liberia: Mr. William Coppinger, consul-general.

On behalf of the Netherlands: Mr. G. de Weckherlin, envoy extraordinary and minister plenipotentiary.

On behalf of Turkey: Rustem Effendi, secretary of legation.

The delegates were formally presented to the Secretary of State of the United States, the Hon. Frederick T. Frelinghuysen, in his office at 12 o'clock. Upon assembling in the diplomatic hall, he called the Conference to order, and spoke as follows:

GENTLEMEN: It gives me pleasure, in the name of the President of the United States, to welcome you to this Congress, where most of the nations of the earth are represented. You have met to discuss and consider the important question of a prime meridian for all nations. It will rest with you to give a definite result to the preparatory labors of other scientific associations and special congresses, and thus make those labors available.

Wishing you all success in your important deliberations, and not doubting that you will reach a conclusion satisfactory to the civilized world, I, before leaving you, take the liberty to nominate, for the purpose of a temporary organization, Count Lewenhaupt.

It will afford this Department pleasure to do all in its power to promote the convenience of the Congress and to facilitate its proceedings.

By the unanimous voice of the Conference the delegate of Sweden, Count LEWENHAUPT, took the chair, and said that, for the purpose of proceeding to a permanent organization, it was necessary to elect a president, and that he had the honor to propose for that office the chairman of the delegation of the United States of America, Admiral C. R. P. **Rodgers.**

The Conference agreed unanimously to the proposition thus made, whereupon Admiral RODGERS took the chair as president of the Conference, and made the following address:

GENTLEMEN: I beg you to receive my thanks for the high honor you have conferred upon me in calling me, as the chairman of the delegation from the United States, to preside at this Congress. To it have come from widely-separated portions of the globe delegates renowned in diplomacy and science, seeking to create a new accord among the nations by agreeing upon a meridian proper to be employed as a common zero of longitude and standard of time reckoning throughout the world. Happy shall we be, if, throwing aside national preferences and inclinations, we seek only the common good of mankind, and gain for science and for commerce a prime meridian acceptable to all countries, and secured with the least possible inconvenience.

Having this object at heart, the Government of the United States has invited all nations with which it has diplomattic relations to send delegates to a Congress to assemble at Washington to-day, to discuss the question I have indicated. The invitation has been graciously received, and we are here this morning to enter upon the agreeable duty assigned to us by our respective Governments.

Broad as is the area of the United States, covering a hundred degrees of longitude, extending from 66° 52′ west from Greenwich to 166° 13′ at our extreme limit in Alaska, not including the Aleutian Islands; traversed, as it is, by railway and telegraph lines, and dotted with observatories; long as is its sea-coast, of more than twelve thousand miles; vast as must be its foreign and domestic commerce, its delegation to this Congress has no desire to urge that a prime meridian shall be found within its confines.

In my own profession, that of a seaman, the embarrassment arising from the many prime meridians now in use is very conspicuous, and in the valuable interchange of longitudes by passing ships at sea, often difficult and hurried, sometimes only possible by figures written on a blackboard, much confusion arises, and at times grave danger. In the use of charts, too, this trouble is also annoying, and to us who live upon the sea a common prime meridian will be a great advantage.

Within the last two years we have been given reason to hope that this great desideratum may be obtained, and within a year a learned conference, in which many nations were represented, expressed opinions upon it with singular unanimity, and in a very broad and catholic spirit.

I need not trespass further upon your attention, except to lay before you the subject we are invited to discuss: the choice of "a meridian to be employed as a common zero of longitude and standard of time reckoning throughout the world;" and I shall beg you to complete our organization by the election of a vice-president and the proper secretaries necessary to the verification of our proceedings.

Mr. LEFAIVRE, delegate from France, stated that on behalf of his colleague he would suggest that all motions and addresses made in English should be translated into French.

The PRESIDENT inquired whether the proposition made by the delegate for France met with the approval of the Conference, when it was unanimously agreed to.

The PRESIDENT thereupon said that he was ready to lay before the Conference the subject of the election of vice-president.

Count LEWENHAUPT, the delegate of Sweden, stated that elections in such large bodies were always difficult, and inquired whether it was

necessary to have a vice-president. He further said that for his part he had every reason to hope and to expect that the services of a vice-president would not be required.

It was thereupon agreed that a vice-president should be dispensed with.

The PRESIDENT then stated that the next business was the election of secretaries, but suggested, in view of the proceedings already had, and of the necessity of some consultation in regard to the matter, that the election might be postponed till to-morrow.

Mr. VALERA, delegate of Spain, stated that he saw no reason why the nomination of secretaries could not be made just as well at present as at any future time.

Mr. LEFAIVRE, delegate of France, inquired what would be the functions of the secretaries.

The PRESIDENT in reply said that an acting secretary had been appointed by the Secretary of State, who was at the same time a stenographer, and that the principal labor of keeping the records of the Conference would devolve upon him; that, nevertheless, regular secretaries of the Conference had to be appointed for the purpose of examining and verifying the protocols from day to day, which would be the more important in the event of the records of the Conference being made in two or three different languages, and that these secretaries ought, no doubt, to be members of the Conference, in order to give the requisite authenticity to the acts thereof, and, in view of the character of the proceedings, should be specialists, and informed as to the subjects under discussion.

Mr. SOTELDO, delegate of Venezuela, said that he thought the Conference should adjourn until to-morrow, as they had done already enough to-day in settling its organization; that by adjourning over it would give an opportunity to the delegates to consult as to the functions of the secretaries, and who would be most likely to be qualified for those functions; that there were gentlemen from different countries who were not familiar with the English language, and by to-morrow the Conference could determine as to the languages in which the proceedings should be had, although, as it seemed to him, that the proceedings should be recorded in French and English. He then moved that the Conference adjourn until to-morrow.

Mr. LEFAIVRE, delegate of France, stated that he agreed with what had been said by the president, that the Conference should have secretaries who were specialists, and that the proceedings should be recorded in two languages. By adjourning till to-morrow he thought that the delegates would have an opportunity to reflect upon the subject, and to come back prepared to vote upon it.

The PRESIDENT then stated that if any delegates wished to make propositions in regard to the proceedings to-morrow it would be in the power of the Conference to proceed to the consideration of those subjects after the election of the secretaries, and he suggested to the delegate of Venezuela (Mr. Soteldo) that the motion to adjourn be withdrawn for the present.

The delegate of Venezuela thereupon withdrew his motion.

Mr. FREY, delegate of Switzerland, said that, in his opinion, the order of proceedings to-morrow should be first a general discussion.

Mr. VALERE, delegate of Spain, stated that he thought the proceedings should be recorded in two languages at least, and that secretaries conversant with these languages and specially acquainted with the sub-

ject-matter pending before the Conference should be selected; that, in order to have the record of the proceedings accurate, officers qualified in this way were requisite, and that it would be preferable to elect these officers after consultation among the members of the Conference, which could be had between now and the meeting to-morrow.

Count LEWENHAUPT, delegate of Sweden, said that he saw no difficulty in deciding now that the order of proceedings to-morrow would be first the election of the secretaries and then a general discussion, and he moved that this proposition be adopted.

The Conference then unanimously agreed to the proposition.

Professor ABBE, delegate of the United States, inquired whether it would not facilitate the action of the Conference to-morrow if the president appointed a committee now who could nominate the secretaries.

The PRESIDENT replied by asking whether it would not be better to select this committee at a subsequent meeting, rather than at the first meeting, which was held to-day.

Commander SAMPSON, delegate of the United States, then gave notice that at the session to-morrow he would bring before the Conference the question whether the meetings shall be open to the public or not, and that he would, at the proper time, also make a motion for the purpose of determining the sense of the Conference as to the propriety of inviting distinguished scientists, some of whom are now in Washington, and who may desire to be present at the meetings of this Conference, to take part in the discussion of the questions pending.

Mr. LEFAIVRE, delegate of France, stated that in regard to the first proposition—that is, as to making the proceedings public, he would object, inasmuch as he thought that by opening the doors of this Conference to the public nothing could be gained, while the proceedings might be embarrassed or delayed by such a course.

Professor ADAMS, delegate of England, stated that he did not favor the first proposition to make the proceedings of this Conference public, but he did agree with the second proposition, and thought it was a very important and valuable one.

The PRESIDENT remarked that the propositions made by the delegate of the United States of America were merely in the nature of a notice, and that they were not before the Conference at the present time, and, consequently, were not the subject of discussion; still he thought that much good could be elicited from this interchange of opinions in a preliminary way.

Captain STEWART, delegate of Paraguay, said that he thought that it would be a very good thing, in view of the proposition to make the meetings public, to invite all the world to the capital for the discussion of these subjects.

Professor ABBE, delegate of the United States, stated that it would be perfectly practicable to have the discussions of the Conference printed in full from day to day for our own official use, and that the public might thereby be made familiar with the proceedings if it were necessary.

The PRESIDENT announced that arrangements had been made by the State Department whereby the proceedings of each day would be printed and furnished in time for the examination of the members of the Conference before the next meeting, and that they would be printed in two languages, French and English; but that these records or protoco s could not be regularly verified until the Conference shall have appointed duly authorized secretaries.

BARON VON SCHÆFFER, delegate of Austria-Hungary, asked that a

list of the delegates be presented to each of the members of the Conference.

The PRESIDENT replied that he would instruct the acting secretary (Mr. Peddrick) to have the list prepared.

Upon the motion of Mr. DE STRUVE, delegate of Russia, the Conference then adjourned until to-morrow (Thursday), the 2d instant, at 1 o'clock p. m.

II.

SESSION OF OCTOBER 2, 1884.

The Conference met pursuant to adjournment in the diplomatic hall of the Department of State, at 1 o'clock p. m.

Present:

Austria-Hungary: Baron Ignatz von Schæffer.
Brazil: Dr. Luiz Cruls.
Colombia: Commodore S. R. Franklin.
Costa Rica: Mr. Juan Francisco Echeverria.
France: Mr. A. Lefaivre, Mr. Janssen.
Germany: Baron H. von Alvensleben, Mr. Hinckeldeyn.
Great Britain: Sir F. J. O. Evans, Prof. J. C. Adams, Lieutenant-General Strachey, Mr. Sandford Fleming.
Guatemala: Mr. Miles Rock.
Hawaii: Hon. W. D. Alexander, Hon. Luther Aholo.
Italy: Count Albert de Foresta.
Japan: Professor Kikuchi.
Mexico: Mr. Leandro Fernandez, Mr. Angel Anguiano.
Paraguay: Capt. John Stewart.
Russia: Mr. C. de Struve, Major-General Stebnitzki, Mr. Kologrivoff.
San Domingo: Mr. de J. Galvan.
Salvador: Mr. Antonio Batres.
Spain: Mr. Juan Valera, Mr. Emilio Ruiz del Arbol, and Mr. Juan Pastorin.
Sweden: Count Carl Lewenhaupt.
Switzerland: Col. Emile Frey, Professor Hirsch.
United States: Rear-Admiral C. R. P. Rodgers, Mr. Lewis M. Rutherfurd, Mr. W. F. Allen, Commander W. T. Sampson, Prof. Cleveland Abbe.
Venezuela: Señor Dr. A. M. Soteldo.

Absent:

Chili: Mr. F. V. Gormas, Mr. A. B. Tupper.
Denmark: Mr. C. S. A. de Bille.
Liberia: Mr. William Coppinger.
Netherlands: Mr. G. de Weckherlin.
Turkey: Rustem Effendi.

The PRESIDENT stated that the first business before the Conference was the election of secretaries.

Mr. DE STRUVE, delegate of Russia, stated that it was his opinion that it would be very difficult to elect secretaries by a direct vote, and he proposed that the selection of the secretaries be left to a committee to be appointed by the president; that the committee present the names of the officers selected to the Conference, and that these secretaries be four in number.

Count LEWENHAUPT, delegate of Sweden, stated that it was generally understood among the delegates that Mr. Hirsch, one of the delegates from Switzerland, should be elected a secretary, as he was a secretary of the conference held at Rome, but as he has not yet arrived, he proposed that the Conference elect only three secretaries to-day.

Mr. DE STRUVE, delegate of Russia, stated that he believed that Mr. Hirsch would soon arrive, and he accepted the amendment just offered.

The original motion, as modified by the amendment, was thereupon unanimously agreed to.

The chair appointed the delegate of Russia, Mr. de Struve, the delegate from Spain, Mr. Valera, the delegate from France, Mr. Lefaivre, and the delegate from Sweden, Count Lewenhaupt, as the committee to select the secretaries.

The Conference thereupon took a recess, to enable the committee to consult and report.

Upon the reassembling of the Conference, the delegate of Sweden, Count Lewenhaupt, announced that the committee had selected for secretaries the delegate from Great Britain, Lieutenant-General Strachey, the delegate of France, Mr. Janssen, and the delegate from Brazil, Dr. Cruls.

The report of the committee was then unanimously adopted by the Conference, and the deiegates named as secretaries signified their acceptance of the office.

Mr. DE STRUVE, delegate of Russia, moved that the president direct the acting secretary to arrange the seats of the delegates according to the alphabetical order of the countries represented. He added that it would be a great convenience to the members to have their seats permanently fixed.

The motion was unanimously agreed to.

Commander SAMPSON, delegate of the United States, then presented the following resolution:

Resolved, That the Congress invite Professor Newcomb, superintendent of the United States Nautical Almanac; Professor Hildgard, superintendent of the United States Coast and Geodetic Surveys; Prof. A. Hall; Prof. de Valentiner, director of the Observatory at Karlsruhe; and Sir William Thomson, to attend the meetings of this Congress.

General STRACHEY, delegate of England, stated that, as he understood this resolution, it would not necessarily authorize the parties invited to take any part in the discussions.

The PRESIDENT stated that the resolution seems merely to invite the gentlemen to be present.

General STRACHEY, delegate of Great Britain, stated that he thought it necessary to clear up this matter a little; that if the gentlemen invited could not address the Conference it seemed very little use to have them invited; that it was not for their own advantage but for that of the Conference that the invitations were extended to those scientific gentlemen, and therefore he thought it was the intention in inviting them to have the benefit of any information which they might desire from time to time to express on the subjects before the Congress. He thought that if any remarks on the part of these gentlemen were presented to the Conference, with the assent of the Congress, through the President, that would doubtless meet all the requirements of the case.

The PRESIDENT inquired whether the delegate of Great Britain meant that the remarks should be presented in writing.

General STRACHEY, delegate of Great Britain, replied that that would not necessarily be the case.

Professor ABBE, delegate of the United States, inquired whether the persons named in the resolution were the only ones to be invited.

The PRESIDENT replied that it was so, so far as the chair was informed, but that it would be in order at any time to add new names in the same way.

Professor ABBE, delegate of the United States, stated that this was a matter which he had very much at heart, and he would like to observe that some of the nations which were invited to send delegates to this Conference had failed to do so, and that it would be a courtesy to invite persons of those nations to be present.

Commander SAMPSON, delegate of the United States, stated that after consulting with a number of the delegates he drew the resolution, and that it was suggested to him this very morning that possibly there might be a difference of opinion as to whether these gentlemen should take part in the discussion, and that that was the reason why the first resolution merely proposed to invite them to be present. He stated that he proposed subsequently to submit another resolution authorizing these gentlemen to take part in the discussion; that he thought that the original intention was to confer an honor on certain distinguished scientists, and that it would be well for the Conference to limit the invitation to gentlemen of that character.

Mr. LEFAIVRE, delegate of France, stated that he was opposed to the proposition to admit to the deliberations of this Conference gentlemen, no matter how distinguished or eminent they might be, who were not specially delegated by their Governments as members of this body.

He questioned the power of the Conference to admit to its discussions persons who were not regularly appointed to vote upon the subject at issue; that this was an international conference created for the purpose of obtaining an interchange of views from the representatives of the different Governments; that it would extend the scope of the work before this body to entertain the views and opinions of persons not authorized to speak for the Governments whose delegates are here; that there would be a great divergence of opinion among such men, and the result would be rather to embarass than to help this Conference to an accord. He insisted that the matter was exclusively governmental, and, while he would be happy to extend any courtesy to men distinguished in science, such as the gentlemen who are proposed to be invited, he felt constrained to oppose the proposition under the circumstances.

The PRESIDENT stated that he understood that the resolution did not propose to confer a vote upon the gentlemen invited, but simply to enable them to lay any information before the Conference which they might have upon the matter at issue.

Mr. LEFAIVRE, delegate of France, contended that the resolution was intended to authorize these gentlemen to deliberate, and he thought that the inconvenience would be very great of extending this privilege to persons not authorized to represent their Governments. He did not think it was reasonable or fair that his opinions should be questioned or opposed by the opinions of men not authorized to speak for their Governments.

General STRACHEY, delegate of Great Britain, said that as he had taken upon himself to make some remarks both as to the manner in which the gentlemen should be invited and the extent of their rights when invited, he wished to say that while he agreed with much that had been said by the delegate of France, he held that these gentlemen should have an opportunity of expressing their views; that they were not to

come here merely to listen to the proceedings, but that they should themselves be heard.

The PRESIDENT directed that the reolution be read in French, and then put it to the vote, when it was unanimously adopted.

Commander SAMPSON, delegate of the United States, then offered the following resolution:

Resolved, That the gentlemen who have just been invited to attend the meetings of the Conference be permitted to take part in the discussion of all scientific questions.

Mr. LEFAIVRE, delegate of France, then stated that it was not in accordance with the object of this Conference that private individuals, not authorized by their respective Governments, should be permitted to influence the decision of this body, and that, while it was very proper to extend courtesy to such learned gentlemen as were invited, it surely was never intended that they should participate in our proceedings.

General STRACHEY, delegate of Great Britain, said that it would, perhaps, save trouble if he stated his views on the point under discussion, which he apprehended were generally in accordance with those of the representative from France. He said that, if he was permitted, he would read a resolution, which he suggested might be accepted as a substitute for that pending before the Conference, and it was as follows:

Resolved, That the President be authorized, with the concurrence of the delegates, to request an expression of the opinions of the gentlemen invited to attend the Congress on any subject on which their opinion may be likely to be valuable.

The PRESIDENT inquired in what way they would express it.

General STRACHEY, delegate of Great Britain, stated that it would be orally.

The PRESIDENT replied that the resolution undoubtedly read that way.

General STRACHEY, delegate of Great Britain, stated that the language, "to take part in the discussion," employed in the resolution of Commander Sampson, would mean that the persons invited would be in a position, of their own motion, either to reply to remarks made, or to state their own views, or to take part in the discussion just as the delegates are entitled to do.

Mr. LEFAIVRE, delegate of France, stated that he hoped that the proposition of the delegate of Great Britain would not be pressed until a vote was had upon the original resolution.

The PRESIDENT then put the resolution to a vote; but, being unable to determine from the *viva voce* vote whether it was carried or not, he stated that the roll would be called.

Mr. FREY, delegate of Switzerland, stated that he thought before the vote was taken a decision should be had upon the question how the delegates were to vote—whether as nations or as individuals.

The PRESIDENT announced that it had been the custom in all such conferences to vote as nations, each nation casting one vote, and that no other way seemed practicable; and that in conformity with this ruling the roll would be called and the vote taken by nations.

The roll was then called, when the following states voted in the affirmative: Costa Rica, Italy, San Domingo, Switzerland, Guatamala, Mexico, Salvador, Venezuela.

And the following in the negative: Austria-Hungary, Colombia, Germany, Hawaii, Paraguay, Spain, United States, Brazil, France, Great Britain, Japan, Russia, Sweden.

The PRESIDENT then announced that the ayes were 8 and the noes 13, and that the resolution was lost.

General STRACHEY, delegate of Great Britain, then renewed his resolution, which was as follows:

Resolved, That the president be authorized, with the concurrence of the delegates, to request an expression of the opinions of the gentlemen invited to attend the Congress on any subject on which their opinion may be likely to be valuable.

No discussion arose upon this resolution, and it was adopted.

Commander SAMPSON, delegate of the United States, then offered the following resolution:

Resolved, That the meetings of this Congress be open to interested visitors.

Mr. LEFAIVRE, delegate of France, stated that he considered this a subject of great importance; that this was an official and confidential body; scientific, it was true, but also diplomatic; that it was empowered to confer about matters with which the general public have now nothing to do; that to admit the public to the meetings would destroy their privacy and subject the Conference to the influence of an outside pressure which might prove very prejudicial to its proceedings, and that he would object to this resolution absolutely.

No further discussion being had, the president, after a *viva voce* vote of doubtful result, ordered the roll to be called, when the following states voted in the affirmative: Colombia, Guatemala, Salvador, Venezuela, Costa Rica, Paraguay, Spain.

And the following states in the negative: Austria-Hungary, France, Great Britain, Italy, Mexico, San Domingo, Switzerland, Brazil, Germany, Hawaii, Japan, Russia, Sweden, United States.

The PRESIDENT then announced that the ayes were 7 and the noes 14, and the resolution was therefore lost.

The PRESIDENT then said that there would doubtless be some preliminary general discussion on the subject before the Conference, and suggested that if delegates desired to be heard upon the subject it would be expedient to give an intimation to the secretary.

Professor ABBE, delegate of the United States, then said: I have been requested to present to the Conference the communication that I hold in my hand, and in doing so wish to offer the following resolution:

Whereas several persons desire to submit to this Conference inventions, devices, and systems of universal time; therefore,

Resolved, That the Conference will acknowledge the receipt of such communications, but will abstain from any expression of opinion as to their respective merits.

Professor ADAMS, delegate of Great Britain, said that the Conference should be very cautious in admitting the devices and schemes of people who have no connection with this body; that there are, no doubt, many inventors and many people who have plans and schemes which they wish to press upon the Conference, and that it was probable that the Conference would be subjected to very great inconvenience if they took upon themselves even the burden of acknolewdging the receipt of these communications.

The PRESIDENT stated that he had received several communications of this character, one proposing that Jerusalem should be taken as the prime meridian.

Mr. LEFAIVRE, delegate of France, proposed that the Conference should appoint a committee to examine the different papers submitted by outside parties, and to make such suggestions as they might deem proper after examining the papers.

Mr. VALERA, delegate of Spain, said that it seemed to him the proper course of proceeding for the Conference was to take up the subject article by article, and treat it in that order; that there were presented to the Conference certain well-defined propositions, and that besides these there were the resolutions which had been adopted by the conference at Rome, which could be used as a basis for the discussions of this Conference; that in that way the delegates would have before them some precise subject-matter, and after discussion, if any proposition needed to be altered or amended it would be in the power of the Conference to do so, but that unless some regular method of proceeding were adopted the sessions would be prolonged indefinitely, and the Conference would be confused by a multitude of irrelevant propositions that might be presented to them.

Mr. RUTHERFURD, delegate of the United States, stated that it seemed to him that to invite a general discussion upon the subject, which has undoubtedly a great many heads, the best method would be the one just suggested; that by having a well-defined course much time would be saved, and there would be a precision in the proceedings, which undoubtedly is always valuable; that in this way the discussion could be kept within bounds, but unless there is some proposition pending before the Conference it is impossible to say whether any discussion is in order or out of order; that it seemed to him there should be some well-defined propositions laid before the Conference, and those propositions could easily be gathered, not only from what has gone before, not only from the conference which has been held in Rome, but from the acts of Congress and the circulars of the Secretary of State, under which this body has been organized.

The PRESIDENT stated that if these communications from outside parties were brought before the Conference it would entail a great deal of labor.

The resolution of the delegate of the United States, Professor ABBE, was then put to the vote, and was negatived.

Mr. RUTHERFURD, delegate of the United States, then presented the following resolution:

Resolved, That the Conference proposes to the Governments represented the adoption as a standard meridian that of Greenwich, passing through the center of the transit instrument at the Observatory of Greenwich.

Mr. LEFAIVRE, delegate of France, remarked that the proposed resolution seemed to him out of order, and that his colleague, Mr. Janssen, desired to address the Conference on the subject. He went on to say:

The competence of the Conference can give rise to no long debate among us. Let us remark, in the first place, that no previous engagement exists, on the part of the Governments, to adopt the results of our discussions, and that consequently our decisions cannot be compared to those of a deliberative congress or an international commission acting according to definite powers.

We have no definite powers, or rather, we have no executive power, since our decisions cannot be invoked executively by one Government toward others.

Does this mean that our decisions will be wholly unauthoritative? An assembly which numbers so many eminent delegates, and in which there is so much scientific knowledge, must certainly be regarded with profound respect by all the powers of the world. Its powers, however, must be of a wholly moral character, and will have to be balanced against rights and interests no less worthy of consideration, leaving absolutely intact the independence of each individual state.

Under these circumstances, gentlemen, it seems to me that our course is already marked out for us. From our Conference is to be elicited the expression of a collective wish, a draft of a resolution, which is to be adopted by the majority of this assembly, and afterwards submitted to the approval of our respective Governments.

This is our mission. It is a great one, and has a lofty international bearing. We must, however, realize its extent from the very outset, and not go beyond its limits.

An appeal has been made to the decisions of the conference held at Rome. But, gentlemen, I beg leave to remark that that conference was composed entirely of specialists, and that it did not meet for the purpose of examining the question in an international point of view. This Conference is composed of various elements, among which are scientists of the highest standing, but also functionaries of high rank, who are not familiar with scientific subjects, and who are charged with an examination of this question from a political stand-point. It is, moreover, our privilege to be philosophers and cosmopolitans, and to contemplate the interests of mankind not only for the present, but for the most distant future.

You see, gentlemen, that we enjoy absolute freedom, and that we are in no wise bound by the decisions of the conference held at Rome. It is even desirable that those precedents should be appealed to as little as possible, inasmuch as we have scientists among us who are regarded as authorities in both the Old and the New World, and who are perfectly capable of directing us in technical matters, and of furnishing all the information that we can desire. I will say even more than this: The results of the conference held at Rome are by no means regarded as possessing official authority by the Governments that have accredited us; for if those results had been taken as a starting point, there would be no occasion for our Conference, and our Governments would simply have to decide with regard to the acceptance or rejection of the resolutions adopted by the Geodetic Congress at Rome.

Everything, however, is intact; even the scientific side of the question, and that is the reason why we have so many delegates possessing technical knowledge among us.

The PRESIDENT stated that he considered the resolution entirely in order, and likely to bring about a discussion upon the very point for which this Conference was called together; that the resolution was open to any amendment that might be offered, could be altered from time to time, if necessary, and, if it did not meet the sense of the Conference, could be defeated.

Mr. LEFAIVRE, delegate of France, inquired whether this proposition did not demand an immediate solution.

Mr. RUTHERFURD, delegate of the United States, replied that no such thing was contemplated.

Professor JANSSEN, delegate of France, then spoke as follows:

GENTLEMEN: I formally request that the resolution just proposed by my eminent colleague and friend, Mr. Rutherfurd, he held in reserve, and that it may not now be pressed for discussion.

It is wholly undesirable that a proposition of so grave a character, which forestalls one of the most important resolutions that we shall be called upon to adopt, should be put to the vote while our meeting has scarcely been organized, and before any discussion relative to the true merrits of the questions to be considered has taken place. This would be inverting the proper order of things and reaching a conclusion before having examined the subject before us.

Before discussing the question of the selection of a meridian which is to serve as a common zero of longitude for all the natlons of the world (if the Congress shall think proper to discuss that point), it is evident that we must first decide the question of principle which is to govern all our proceedings, that is to say, whether it is desirable to fix upon a common zero of longitude for all nations. I therefore formally ask for the withdrawal of Mr. Rutherfurd's proposition.

The PRESIDENT stated that as something had been said about the conference at Rome, he desired to say that he had carefully abstained from any allusion to it, and that the delegation of the United States found no allusions to it in their instructions; that, so far as the chair understood the resolution offered by the delegate of the United States, it was simply to bring before the Conference the consideration of the subject of a prime meridian; that he did not understand that even the delegate who presented the motion offered it as an expression of his own opinion on the subject, but that he had carefully stated, when he had brought the resolution before the Conference, that it was for the purpose of enabling the delegates to proceed to an immediate discussion. He added, further, that the resolution was quite open to amendment in case the delegates from France desired to amend it.

Commander SAMPSON, delegate of the United States, stated that he wished to offer the following as a substitute for the resolution already pending:

Resolved, That it is the opinion of this Congress that it is desirable to adopt a single prime meridian for all nations in place of the multiplicity of initial meridians which now exist.

Mr. RUTHERFURD, delegate of the United States, then announced that he accepted this substitution in place of the first resolution.

General STRACHEY, delegate of England, stated that if he rightfully understood the remarks made by the delegate of France, Mr. Lefaivre, he thought that it was intended to call attention to the ultimate form in which the resolutions of this Congress should be recorded. He referred to the address which the Secretary of State of the United States (Mr. Frelinghuysen) made to the delegates on their assembling, in which he said: "You have met to discuss and consider the important question of a prime meridian for all nations. It will rest with you to give a definite result to the preparatory labors of other scientific associations and special congresses, and thus make those labors available."

He added that the object at which they should aim was to put together a series of resolutions which could be presented to the various Governments whose representative are here present, with a view to inducing them to accept the decision which may be arrived at by this Conference, and, finally, to put that decision in a diplomatic form—a form which shall be more definite and precise than the mere resolutions which would be adopted by a purely scientific body; this he understood to be the position to be adopted by the delegates to this Conference. He then said that it seemed to him that it would be necessary, after settling the original shape of the resolutions, that they should be reconsidered and afterwards put together in an orderly way, in a manner which would give a regular and satisfactory record of the proceedings; that it appeared almost certain to him that the discussions would be desultory in their nature, but that ultimately a revision would be had after the rough-hewing of the blocks out of which the edifice was to be formed; that he had no wish, at the present stage of the discussion, to go into the merits of the question presented; that, for his part, he thought it more prudent

to abstain, but that with reference to the remarks of his honorable friends from France, he could not agree that they should set aside what occurred at Rome; that the discussions at Rome were most valuable; they went thoroughly into the whole question, and he apprehended that every gentleman in the Conference was possessed of the records of what occurred there.

He continued by saying that he thought that the delegate from France, Mr. Lefaivre, went a little beyond what was strictly right in saying that we should shut our eyes to what occurred there; that, for his own part, he was obliged to pay attention to what occurred there; that some of the most eminent scientific men to be found in any country met there and fully discussed the questions now before us, and that the delegates here present were now called upon to revise what occurred there.

Mr. RUTHERFURD, delegate of the United States, said that the delegate from France, Mr. Lefaivre, in his remarks, insisted that we should first establish for what purpose the delegates were here assembled; that he wished to refer to the circulars sent out by the Government of the United States, under which this Conference was called together. He said that he could assert, without fear of contradiction, that in those communications the President stated that it was believed to be a foregone conclusion that a prime meridian was desirable; that that was the basis on which the President acted in giving his invitation; that how he came to that conclusion he does not state—whether or not the proceedings at Rome had anything to do with it, but he thought that they had a great influence on the mind of the President; that, doubtless, his action was not determined solely by that, and therefore, that the Secretary of State first made a tentative application to see whether a proposition for another conference was acceptable, and that he found all countries here represented answering the circular in the affirmative; that they agreed with him that a conference for this purpose was desirable.

He continued by saying that the Secretary of State then sent a second invitation to the different nations to send delegates, who were to assemble here on the 1st of October, 1884, for the purpose of establishing a prime meridian and a universal time. He added that it seemed to him a great loss of time to go over the question whether a prime meridian was or was not desirable; that the delegates were sent here for the purpose of agreeing upon a prime meridian. He then asked why this Conference should lose time in discussing that question.

The resolution offered by the delegate of the United States, Commander SAMPSON, was then unanimously adopted as follows:

Resolved, That it is the opinion of this Congress that it is desirable to adopt a single prime meridian for all nations in place of the multiplicity of initial meridians which now exist.

Mr. RUTHERFURD, delegate of the United States, then renewed his original resolution, as follows:

Resolved, That the Conference proposes to the Governments represented the adoption as a standard meridian that of Greenwich, passing through the center of the transit instrument at the Observatory of Greenwich.

Mr. JANSSEN, delegate of France, stated that he wished to reiterate the objections that he had already offered to the first resolution, and spoke as follows:

GENTLEMEN: Mr. Lefaivre, my honorable colleague, and I are of the opinion that the mission of this Congress is chiefly to examine questions of principle.

I consider that we shall do a very important thing if we proclaim the principle of the adoption of a meridian which shall be the same for all nations.

The advantages of such a meridian have been felt by the geographers and navigators of all ages. France might claim the honor of having sought to accomplish this reform as early as the seventeenth century. It is not to be expected, therefore, that France, at this late day, will seek to place any obstacles in the way of the adoption of an improvement which would by this time have been adopted, if the use of the meridian which she proposed, and which she had caused to be generally accepted, had been continued.

We therefore fully agree with you, gentlemen, as to the principle of a common international meridian, impartially defined and wisely applied, and we think that if the Congress should cause a useful reform, which has been so long expected, to be finally adopted, it would render a great service to the world, and one that would do us the highest honor.

This point being gained, is it proper for us to proceed to the adoption of such a meridian? We think not, unless we are assured by a previous declaration as to the principle which is to govern the selection of that meridian. Without such a declaration, we should have no power to begin a discussion on an undefined subject, and we are not authorized to pledge ourselves.

I must even add that our acquiescence in the principle of an international meridian could not be maintained if the Congress proceeded to a choice at variance with the exclusively scientific principles which we are instructed to maintain. Thus, in the very interest of the great principle which we all desire to see adopted, it would, to my way of thinking, be wiser to confine ourselves to a general declaration which, by uniting the opinions of all, would sustain the principle with all the authority possible. The principle having once been adopted, our Governments would subsequently convoke a conference of a more technical character than this, at which questions of application would be more thoroughly examined.

Mr. VALERA, delegate of Spain, stated that it seemed to him the order of proceeding for this Conference was very well laid down in the invitations addressed by the President of the United States to the different countries, and in the articles which were formulated at Rome; that if these were taken up one after the other and discussed, there would be a clearly-defined line of action for the delegates; that if an article was not satisfactory, it could be altered or amended, or could be rejected; but if the propositions were taken up one at a time, and the discussions directed to these propositions, the Conference would be more likely to reach a definite result than in any general discussion.

The PRESIDENT stated that, so far as he understood the proposition, there was no desire to press it to an immediate vote; that it was quite proper for the delegate from France to offer any other proposition, as suggested by the delegate of Spain, in lieu of the motion now pending; that so far as the chair was concerned, it seemed to him that the Conference could at once proceed to the discussion of the general subject of a prime meridian under the pending resolution; that if the delegate from France desires to make any other proposition, or offer anything else in a distinct form, he will be listened to with great attention and with profound respect.

Mr. RUTHERFURD, delegate from the United States, remarked that the delegate from France, his learned friend, Mr. Janssen, had expressed the opinion that the delegates had not the power to decide upon

any particular meridian, but that they were sent here merely to discuss this principle, namely, whether a general meridian was desirable. He added that he was, of course, not in possession of the instructions which the delegates from France received from their own Government, but that he found among the instructions received by the delegates of the United States from their Government a copy of one of the communications made by the President of the United States to France, as well as to the other nations, through the Secretary of State, in which was this language:

> I am accordingly directed by the President to request you to bring the matter to the attention of the Government of ——, through the minister for foreign affairs, with a view to learning whether its appreciation of the benefits to accrue to the intimate intercourse of civilized peoples from the consideration and adoption of the suggested common standard of time so far coincides with that of this Government as to lead it to accept an invitation to participate in an international conference at a date to be designated in the near future.

The delegate of the United States continued by saying that the whole object of this Conference was not to establish the principle that it is desirable to have a prime meridian, but to fix that prime meridian; that that was the object of the meeting, and that it seemed to him that there must be some misapprehension on the part of the learned gentleman from France in thinking that this Conference has not the power to fix upon a prime meridian; that as to our organization, the delegate of France (Mr. Lefaivre) spoke of its not being sufficiently complete to take up this subject at present, but that it seemed to him that the delegates undoubtedly were ready to hear and express arguments *pro* and *con* in regard to that question; that he supposed that every delegate had studied this matter before coming here, and that he did not think that any delegate would be likely to come here unless he knew, or thought he knew, something about this matter.

Mr. VALERA, delegate from Spain, announced that he had no power to pledge his country on this subject; that his authority merely extended to the power of recommending to his Government such resolutions as this Conference might adopt.

Count LEWENHAUPT, delegate of Sweden, then said:

I desire to state in the protocol that I have no power to engage my Government by my votes on the different questions which will be submitted to this Conference, and that, therefore, these votes must only be considered as an engagement on my part to recommend to my Government the decisions for which I vote.

General STRACHEY, delegate of Great Britain, said that in the name of the delegates of Great Britain he wished to state that they were in the same position, but that would not prevent them or this Conference from forming an opinion and expressing it.

The PRESIDENT stated that, on behalf of the delegates from the United States, they had no power except that of discussion and recommendation.

Mr. DE STRUVE made, on behalf of the delegates of Russia, a declaration identical with that made by the delegate of Sweden.

Baron VON ALVENSLEBEN, delegate from Germany, made the same announcement on behalf of his Government.

Mr. FERNANDEZ, delegate from Mexico, made the same announcement.

Mr. VALERA, delegate of Spain, remarked that this Conference was called together not merely to discuss the subject of a prime meridian, but to determine, so far as these delegates were concerned, the propriety of adopting a particular prime meridian, and that his Government would

decide afterwards whether it would accept what this Conference should recommend.

Dr. CRULS, delegate of Brazil, stated that his Government authorized him to take part in the discussion, but not to commit his Government to the adoption of any particular proposition.

Mr. FLEMING, delegate of Great Britain, said that he would like to call the attention of the Conference to the language of the act of Congress calling this Conference together, and that language runs as follows:

> That the President of the United States be authorized and requested to extend to the Governments of all nations in diplomatic relations with our own an invitation to appoint delegates to meet delegates from the United States in the city of Washington, at such time as he may see fit to designate, for the purpose of fixing upon a meridian proper to be employed as a common zero of longitude and standard of time-reckoning throughout the globe.

He added that he thought the object of the Conference clearly was to determine and to recommend; that although the word "recommend" was not used in the body of the resolution, it was certainly understood, and, as a matter of fact, the title of the joint resolution passed by Congress contains the word "recommend." It reads as follows:

> An act to authorize the President of the United States to call an international conference to fix on and recommend for universal adoption a common prime meridian, to be used in the reckoning of longitude and in the regulation of time throughout the world.

Baron VON SCHÆFFER, delegate of Austria-Hungary, then moved that the Conference adjourn until Monday, the 6th inst., at 1 o'clock, to enable delegates to confer on this subject.

The proposition of the delegate of Austria-Hungary was then agreed to, and the Conference adjourned to Monday, October 6, 1884, at 1 o'clock p. m.

III.

SESSION OF OCTOBER 6, 1884.

The Conference met pursuant to adjournment in the diplomatic hall of the Department of State, at 1 o'clock p. m.

Present:

Austria-Hungary: Baron Ignatz von Schæffer.
Brazil: Dr. Luiz Cruls.
Colombia: Commodore S. R. Franklin.
Costa Rica: Mr. Juan Francisco Echeverria.
France: Mr. A. Lefaivre, Mr. Janssen.
Germany: Baron H. von Alvensleben, Mr. Hinckeldeyn.
Great Britain: Capt. Sir F. J. O. Evans, Prof. J. C. Adams, Lieutenant-General Strachey, Mr. Sandford Fleming.
Guatemala: Mr. Miles Rock.
Hawaii: Hon. W. D. Alexander, Hon. Luther Aholo.
Italy: Count Albert de Foresta.
Japan: Professor Kikuchi.
Mexico: Mr. Leandro Fernandez, Mr. Angel Arguiano.
Paraguay: Capt. John Stewart.
Russia: Mr. C. de Struve, Major-General Stebnitzki, Mr. Kologrivoff.
San Domingo: Mr. de J. Galvan.

Salvador: Mr. Antonio Batres.
Spain: Mr. Juan Valera, Mr. Emilio Ruiz del Arbol, Mr. Juan Pastorin.
Sweden: Count Carl Lewenhaupt.
Turkey: Rustem Effendi.
United States: Rear-Admiral C. R. P. Rodgers, Mr. Lewis M. Rutherfurd, Mr. W. F. Allen, Commander W. T. Sampson, Prof. Cleveland Abbe.
Venezuela: Dr. A. M. Soteldo.

Mr. RUTHERFURD, delegate of the United States, said that the resolution offered by him at the last meeting omitted to state that the proposed meridian was for longitude, and he would offer the following as a substitute therefor:

Resolved, That the Conference proposes to the Governments here represented the adoption of the meridian passing through the center of the transit instrument at the Observatory of Greenwich as the standard meridian for longitude.

The PRESIDENT then asked if the Conference would permit the substitution to be made, and it was unanimously agreed to.

Mr. RUTHERFURD, delegate of the United States, stated that he did not propose to press the resolution to an early vote, but that it was offered simply to elicit the opinions of delegates on the subject. He further stated that, having heard that the delegates of France, Mr. Lefaivre and Mr. Janssen, desired to present certain propositions, he would, for that purpose, move to withdraw for the time being the resolution offered by him.

No objection being made, the resolution was temporarily withdrawn.

Mr. LEFAIVRE, delegate of France, then made the following statement:

Our colleague, Mr. Rutherfurd, having withdrawn his motion for the adoption of the meridian of Greenwich, we, the delegates of France, after consultation with him, submit the following motion:

Resolved, That the initial meridian should have a character of absolute neutrality. It should be chosen exclusively so as to secure to science and to international commerce all possible advantages, and in particular especially should cut no great continent—neither Europe nor America.

Sir F. J. O. EVANS, delegate of Great Britain, then stated that he presumed the Conference could hardly pass by the important meeting held at Rome, where twelve of the thirty-eight delegates were directors of national observatories, and where the subject of the conditions which should attach to a prime meridian were discussed without reference to any particular nationality; that these learned gentlemen came to the conclusion (which he thought was a very wise one) that the necessity existed for a prime meridian; that it should pass through an astronomical observatory of the first order; that modern science demanded such precision, and therefore they excluded all ideas of a meridian being established on an island, in a strait, on the summit of a mountain, or as indicated by a monumental building. Looking at the subject in its various aspects, they came to the conclusion that there were only four great observatories which in their minds combined all the conditions, and this decision was unanimously received by that Conference. Those great observatories were Paris, Berlin, Greenwich, and Washington. He stated further, that, having this in view, he thought this Conference should be particularly guarded, looking at the question from a scientific point of view, not to depart from the conditions laid down by the Conference at Rome; that he had no desire to advocate any one of the places enumerated, but merely mentioned them as satisfying all the conditions of science, which was so brilliantly represented at Rome.

Commander SAMPSON, delegate of the United States, then said:

I can only attempt to anticipate the arguments which may be advanced by the learned delegate from France in support of his resolution to adopt a neutral meridian. But it is our simple duty, in our present judicial capacity, to examine the question of a prime meridian from all points of view. With the object, then, of considering the question from another stand-point, I ask your attention for one moment. This Congress, at its last meeting, by a unanimous vote declared its opinion that it was desirable to adopt a single prime meridian for the purpose of reckoning longitude. Further, it is fair to assume that the delegates here assembled, in answer to a specific invitation from the Government of the United States, and for a stated purpose, have come empowered by their respective Governments to act upon the questions submitted for their consideration in the invitation.

At the last meeting the delegates from France left us somewhat in doubt regarding their views upon this important question of the powers of the delegates, or at least of their own delegation; but, as they have to-day advocated the adoption of a neutral meridian, we may conclude that they have the necessary delegated power to fully consider and determine the main question before us—the selection of a prime meridian.

In the absence of any declared opinion to the contrary, we may take it for granted that the delegates from all states here represented are deputed to "fix upon a meridian proper to be employed as a common zero of longitude throughout the globe," and to recommend the same for adoption to their respective Governments.

If, then, we are of one mind as to the desirability of a single prime meridian, and if we are fully empowered to make the selection, which may be taken as another way of saying that we are directed by our respective Governments to make the selection, we may proceed directly to the performance of this duty.

In the choice of a prime meridian there is no physical feature of our earth which commends itself above others as the best starting point, nor does the form of the earth itself present any peculiarity which might be used as an initial point. If the refinements of geodesy should finally lead to the conclusion that the figure of the earth is an ellipsoid with three axes, yet the question of the direction of either of the equatorial axes must remain to such a degree uncertain that the extremity of the axis could not be assumed as the point of departure for counting longitude. Indeed, as an initial meridian must above all things be fixed in position, it would not answer to make its position depend upon any physical constant which is itself in the slightest degree uncertain, for in these days, when refinements in physical measurements are constantly leading to more and more accurate results, each advance in accuracy would necessitate an annoying change in the initial meridian, or, what would more probably result, the retention of the first chosen meridian, which would thus lose its dependence upon the original definition, and become as arbitrary as if taken by chance in the first instance.

We may then say that, from a purely scientific point of view, any meridian may be taken as the prime meridian. But from the stand-point of convenience and economy there is undoubtedly much room for a choice.

Considering this question of convenience in connection with the necessary condition of fixity already referred to, the prime meridian should pass through some well-established national observatory.

In making the choice of a prime meridian which is to serve for a great period of time, it is important to so fix and define it that the natural

changes of time may not render it in the least degree uncertain. To this end, the nation within whose borders the chosen point may fall should engage to establish it in the most enduring manner, and protect it against all possible causes of change or destruction.

When taken in connection with other requirements, to be mentioned hereafter, this character of permanence will be best secured by making the adopted meridian pass through an observatory which is under the control of the Government.

Such observatory should be in telegraphic communication with the whole world, in order that the differences of longitude from the prime meridian may be determined for any point. These conditions of convenience are so important that they may fairly be considered imperative. To fulfill them one of the national meridians now in use should be selected. To select any other than one of these meridians, or a meridian directly dependent upon one of them, and defined simply by its angular distance from one of these national meridians, would be to introduce endless confusion into all charts and maps now in use.

To select a prime meridian, one which shall be a defined angular distance from one of the national meridians, must have for its object either to remove some inconvenience which results from the use of the national meridian itself, or it must be to satisfy a desire to deprive the selected meridian of any nationality.

The inconvenience of east and west longitudes, which results from having the prime meridian pass through a thickly populated portion of the world, will be removed by reckoning the longitude continuously from 0° to 360°. At the same time an important advantage is secured by having the prime meridian occupy a central position with regard to the most densely populated part of the earth; because the distances which will then separate the various points from the central observatory marking the initial meridian will be a minimum, and consequently less liable to error in determination. The selection of a meridian by calculation, defined us a certain number of degrees east or west of one of the national meridians, would not thereby deprive the meridian thus selected of a national character; for though we may reckon longitude from a meridian passing through the Atlantic or Pacific Ocean, yet the initial point from which all measurements of longitude must be made would still remain one of the national meridians. Again, if any other than one of the national meridians were selected, or a meridian dependent upon one of them, as, for example, a neutral meridian in the Atlantic or Pacific Ocean, it would necessitate a change in all charts and maps.

It is hardly necessary to say that no scientific or practical advantage is to be secured by adopting the meridian of the great pyramid, or by attempting to establish permanent meridian marks over a great length of the selected meridian, for even in the present advanced condition of astronomical and geodetic science it is not practicable to establish two points on the same meridian at a considerable distance from each other with such a degree of accuracy as would warrant the use of them indifferently as the initial point.

As a matter of economy as well as convenience that meridian should be selected which is now in most general use. This additional consideration of economy would limit our choice to the meridian of Greenwich, for it may fairly be stated upon the authority of the distinguished delegate from Canada that more than 70 per cent. of all the shipping of the world uses this meridian for purposes of navigation.

The charts constructed upon this meridian cover the whole navigable globe. The cost of the plates from which these charts are printed is

probably 75 per cent. of the cost of all plates in the world for printing mariners' charts, and is probably not less than ten millions of dollars. As a matter of economy, then, to the world at large, it would be better to permit those plates to remain unchanged which are engraved for the meridian of Greenwich, and to make the necessary changes in all plates engraved for other meridians.

A very natural pride has led the great nations to establish by law their own prime meridian within their own borders, and into this error the United States was led about thirty-five years ago.

Should any of us now hesitate in the adoption of a particular meridian, or should any nation covet the honor of having the selected meridian within its own borders, it is to be remembered that when the prime meridian is once adopted by all, it loses its specific name and nationality, and becomes simply the prime meridian.

Mr. RUTHERFURD, delegate of the United States, stated that he did not propose to take up much of the time of the Conference; that he had listened with great pleasure to the exhaustive speech of his colleague, Commander Sampson, but that he wished to say a few words about the conditions of permanence in the prime meridian to which allusion had just been made. He said that he would call attention to the fact that the observatory at Paris stands within the heart of a large and populous city; that it has already been thought by many of the principal French astronomers that it should no longer remain there; that it has been interfered with by the tremors of the earth and emanations in the air, which prevent it from fulfilling its usefulness; that for several years past strenuous efforts have been made to remove the observatory from Paris to some other place where it may be free to follow out its course of usefulness, and that the only thing which keeps it there is the remembrance of the honorable career of that observatory in times past. He added that he was sure that there was no one here who failed to recognize its claims to distinction; that there was no one here acquainted with the past history of astronomy but looks with pride upon the achievements of the human intellect effected there. At the same time, however, if a change is to be made, if sentiment should give way to practical reason, a locality, no doubt, will be found which may be calculated to fulfill the requirements of a prime meridian better than that one.

As to the fitness of Greenwich, he said that the observatory was placed in the middle of a large park under the control of the Government, so that no nuisance can come near it without their consent, and that it was in a position which speaks for itself; that he would only add one word more in regard to this matter, and that is, that the adoption of the meridian of Greenwich as the prime meridian has not been sought after by Great Britain; that it was not her proposition, but that she consented to it after it had been proposed by other portions of the civilized world.

Mr. JANSSEN, delegate of France, said: We do not put forward the meridian of the observatory of Paris as that to be chosen for the prime meridian; but if it were chosen, and we wished to compare it with that of Greenwich as to the accuracy with which it is actually connected with the other observatories of Europe, it would not lose by the comparison. The latest observations of the differences of longitude made by electricity by the Bureau of Longitudes of France and our officers have given very remarkable results of great accuracy. It is well known that what is important for a starting point in reckoning longitude is, above all things, that it should be accurately connected with points whose posi-

tions have been precisely fixed, such as the great observatories. There is, therefore, a slight confusion on the part of my eminent colleague, namely, that of not distinguishing between the conditions which require the exact connection of the starting point of longitudes with observatories, and the merits of the position of such a point in an astronomical aspect, which is here a matter of secondary importance.

Mr. LEFAIVRE, delegate of France, said that he did not know if his observation was well founded, but it seemed to him that what the delegates of France had proposed had not been contested, but that the arguments used had rather been those in favor of the adoption of the meridian of Greenwich.

Mr. RUTHERFURD, delegate of the United States, said that the observations which he had made were merely to be regarded as a negative of the proposition made by the delegates of France, and not as a statement of the arguments in favor of the adoption of Greenwich.

The PRESIDENT said that the remarks of the delegate of the United States were not out of order, inasmuch as they were intended to combat the proposition brought forward by the delegate of France.

Mr. JANSSEN, delegate of France, then spoke as follows:

GENTLEMEN: At the last session, when a proposition was made by my eminent colleague and friend, Mr. Rutherfurd, to discuss and vote upon the adoption of the meridian of Greenwich as the common prime meridian, I thought it necessary to say that the proposal appeared to me prematurely made, and that we could not agree to the discussion proceeding in that manner. Mr. Rutherfurd has informed me that he would withdraw his proposition for the present, in order to permit me to direct the discussion, in the first place, to the principle which should direct the choice of a common prime meridian. I here take the opportunity of thanking Mr. Rutherfurd for his courtesy, and I no longer object to proceeding with the debate.

What we ask is, that after the general declaration of the second session as to the utility of a common prime meridian, the Congress should discuss the question of the principle which should guide the choice of that meridian.

Being charged to maintain before you, gentlemen, the principle of the neutrality of the prime meridian, it is evident that if that principle was rejected by the Congress it would be useless for us to take part in the further discussion of the choice of the meridian to be adopted as the point of departure in reckoning longitude.

We think, gentlemen, that if this question of the unification of longitude is again taken up after so many unsuccessful attempts to settle it as are recorded in history, there will be no chance of its final solution unless it be treated upon an exclusively geographical basis, and that at any cost all national competition should be set aside. We do not advocate any particular meridian. We put ourselves completely aside in the debate, and thus place ourselves in a position of far greater freedom for expressing our opinion, and discussing the question exclusively in view of the interests affected by the proposed reform.

The history of geography shows us a great number of attempts to establish a uniformity of longitude, and when we look for the reasons which have caused those attempts (many of which were very happily conceived) to fail, we are struck with the fact that it appears due to two principal causes—one of a scientific and the other of a moral nature. The scientific cause was the incapacity of the ancients to determine exactly the relative positions of different points on the globe, especially if it was a question of an island far from a continent, and which consequently could

not be connected with that continent by itinerary measurements. For example, the first meridian of Marinus of Tyre and Ptolemy, placed on the Fortunate Isles, in spite of its being so well chosen at the western extremity of the then known world, could not continue to be used on account of the uncertainty of the point of departure. That much to be regretted obstacle caused the method to be changed. It became necessary to fall back on the continent. But then, in place of a single common origin of longitude indicated by nature, the first meridians were fixed at capitals of countries, at remarkable places, at observatories. The second cause to which I just now alluded, the cause of a moral nature—national pride—has led to the multiplication of geographical starting points where the nature of things would have required, on the contrary, their reduction to a single one.

In the seventeenth century, Cardinal Richelieu, in view of this confusion, desired to take up again the conception of Marinus of Tyre, and assembled at Paris French and foreign men of science, and the famous meridian of the island of Ferro was the result of their discussions.

Here, gentlemen, we find a lesson which should not be lost sight of. This meridian of Ferro, which at first had the purely geographical and neutral character which could alone establish and maintain it as an international first meridian, was deprived of its original characteristic by the geographer Delisle, who, to simplify the figures, placed it at 20 degrees in round numbers west of Paris. This unfortunate simplification abandoned entirely the principle of impersonality. It was no longer then an independent meridian; it was the meridian of Paris disguised. The consequences were soon felt. The meridian of Ferro, which has subsequently been considered as a purely French meridian, aroused national susceptibilities, and thus lost the future which was certainly in store for it if it had remained as at first defined. This was a real misfortune for geography. Our maps, while being perfected, would have preserved a common unit of origin, which, on the contrary, has altered more and more.

If, as soon as astronomical methods had been far enough advanced to permit the establishment of relative positions with that moderate accuracy which is sufficient for ordinary geography (and that could have been done at the end of the seventeenth century), we had again taken up the just and geographical conception of Marinus of Tyre, the reform would have been accomplished two centuries sooner, and to-day we should have been in the full enjoyment of it. But the fault was committed of losing sight of the essential principles of the question, and the establishment of numerous observatories greatly contributed to this. Furnishing naturally very accurate relative positions, each one of these establishments was chosen by the nation to which it belonged as a point of departure for longitude, so that the intervention of astronomy in these questions of a geographical nature, an intervention which, if properly understood, should have been so useful, led us further away from the object to be attained.

In fact, gentlemen, the study of these questions tends to show that there is an essential distinction between meridians of a geographical or hydrographical nature and meridians of observatories. The meridians of observatories should be considered essentially national. Their function is to permit observatories to connect themselves one with another for the unification of the observations made at them. They serve also as bases for geodetic and topographical operations carried on around them. But their function is of a very special kind, and should be generally limited to the country to which they belong.

On the contrary, initial meridians for geography need not be fixed with quite such a high degree of accuracy as is required by astronomy; but, in compensation, their operation must be far reaching, and while it is useful to increase as much as possible the number of meridians of observatories, it is necessary to reduce as much as we can the starting points for longitudes in geography.

Further, it may be said that as the position of an observatory should be chosen with reference to astronomical considerations, so an initial meridian in geography should only be fixed for geographical reasons.

Gentlemen, have these two very different functions been always well understood, and has this necessary distinction been preserved? In no wise. As observatories, on account of the great accuracy of their operations, furnish admirable points of reference, each nation which was in a condition to do it connected with its principal observatory not only the geodetic or topographical work which was done at home—a very natural thing—but also general geographical or hydrographical work which was executed abroad, a practice which contained the germ of all the difficulties with which we are troubled to-day. Thus, as maps accumulated, the need of uniformity, especially in those that referred to general geography, was felt more and more.

This explains why this question of a single meridian as a starting point has been so often raised of late.

Among the assemblies which have occupied themselves with this question, the one which principally calls for our attention, is that which was held at Rome last year; indeed, for many of our colleagues the conclusions adopted by the Congress of Rome settle the whole matter. These conclusions must, therefore, receive our special attention.

In reading the reports of the discussions of that Congress, I was struck with the fact that in an assembly of so many learned men and eminent theorists it was the practical side of the question that was chiefly considered, and which finally determined the character of the resolutions adopted.

Thus, instead of laying down the great principle that the meridian to be offered to the world as the starting point for all terrestrial longitudes should have, above all things, an essential geographical and impersonal character, the question was simply asked, which one of the meridians in use among the different observatories has (if I may be allowed to use the expression) the largest number of clients? In a matter which interests geography much more than hydrography, as most sailors acknowledge, because there exist really but two initial hydrographic meridians, Greenwich and Paris, a prime meridian has been taken, the reign (practical influence) of which is principally over the sea; and this meridian, instead of being chosen with reference to the configuration of the continents, is borrowed from an observatory; that is to say, that it is placed on the globe in a hap-hazard manner, and is very inconveniently situated for the function that it is to perform. Finally, instead of profiting by the lessons of the past, national rivalries are introduced in a question that should rally the good-will of all.

Well, gentlemen, I say that considerations of economy and of established custom should not make us lose sight of the principles which must be paramount in this question, and which alone can lead to the universal acceptance and permanence of its settlement. Furthermore, gentlemen, these motives of economy and of established custom, which have been appealed to as a decisive argument, exist, it is true, for the majority in behalf of which they have been put forward, but exist for

them only, and leave to us the whole burden of change in customs, publications, and material.

Since the report considers us of so little weight in the scales, allow me, gentlemen, to recall briefly the past and the present of our hydrography, and for that purpose I can do no better than to quote from a work that has been communicated to me, and which emanates from one of our most learned hydrographers :

> France [he says] created more than two centuries ago the most ancient nautical ephemerides in existence. She was the first to conceive and execute the great geodetic operations which had for their object the construction of civil and military maps and the measurement of arcs of the meridian in Europe, America, and Africa. All these operations were and are based on the Paris meridian. Nearly all the astronomical tables used at the present time by the astronomers and the navies of the whole world are French, and calculated for the Paris meridian. As to what most particularly concerns shipping, the accurate methods now used by all nations for hydrographic surveys are of French origin, and our charts, all reckoned from the meridian of Paris, bear such names as those of Bougainville, La Pérouse, Fleurieu, Borda, d'Entrecasteaux, Beautemps, Beaupré, Duperré, Dumont d'Urville, Daussy, to quote only a few among those who are not living.
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> Our actual hydrographic collections amount to more than 4,000 charts. By striking off those which the progress of explorations have rendered useless, there still remain about 2,600 charts in use. Of this number more than half represent original French surveys, a large part of which foreign nations have reproduced. Amongst the remainder, the general charts are the result of discussions undertaken in the bureau of the marine, by utilizing all known documents, French as well as foreign, and there are relatively few which are mere translations of foreign works. Our surveys are not confined to the coasts of France and of its colonies; there is scarcely a region of the globe for which we do not possess original work—Newfoundland, the coasts of Guiana, of Brazil, and of La Plata, Madagascar, numerous points of Japan and of China, 187 original charts relative to the Pacific. We must not omit the excellent work of our hydrographic engineers on the west coast of Italy, which was honored by the international jury with the great medal of honor at the Universal Exhibition of 1867. The exclusive use of the Paris meridian by our sailors is justified by reference to a past of two centuries, which we have thus briefly recalled.
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> If another initial meridian had to be adopted, it would be necessary to change the graduation of our 2,600 hydrographic plates; it would be necessary to do the same thing for our nautical instructions (sailing directions), which exceed 600 in number. The change would also necessarily involve a corresponding change in the *Connaissance des Temps*.

These are titles to consideration of some importance. Well, if under these circumstances the projected reform, instead of being directed by the higher principles which ought to govern the subject, should take solely for its base the respect due to the established customs of the largest number and the absence on their part of all sacrifice, reserving to us alone the burden of the change and the abandonment of a valued and glorious past, are we not justified in saying that a proposition thus made would not be acceptable?

When France, at the end of the last century, instituted the meter, did she proceed thus? Did she, as a measure of economy and in order to change nothing in her customs, propose to the world the "Pied de Roi" as a unit of measure? You know the facts. The truth is, everything with us was overthrown—both the established methods and instruments for measurement; and the measure adopted being proportioned only to the dimensions of the earth, is so entirely detached from everything French that in future centuries the traveler who may search the ruins of our cities may inquire what people invented the metrical measure that chance may bring under his eyes.

Permit me to say that it is thus a reform should be made and becomes acceptable. It is by setting the example of self-sacrifice; it is by complete self-effacement in any undertaking that opposition is disarmed and true love of progress is proved.

I now hasten to say that I am persuaded that the proposition voted for at Rome was neither made nor suggested by England, but I doubt whether it would render a true service to the English nation if it be agreed to. An immense majority of the navies of the world navigate with English charts; that is true, and it is a practical compliment to the great maritime activity of that nation. When this freely admitted supremacy shall be transformed into an official and compulsory supremacy, it will suffer the vicissitudes of all human power, and that institution (the common meridian) which by its nature is of a purely scientific nature, and to which we would assure a long and certain future, will become the object of burning competition and jealousy among nations.

All this shows, gentlemen, how much wiser it would be to take for the origin of terrestrial longitude a point chosen from geographical considerations only. Upon the globe, nature has so sharply separated the continent on which the great American nation has arisen, that there are only two solutions possible from a geographical point of view, both of them very natural.

The first solution would consist in returning, with some small modification, to the solution of the acients, by placing our meridian near the Azores; the second by throwing it back to that immense expanse of water which separates America from Asia, where on its northern shores the New World abuts on the Old.

These two solutions may be discussed; this has been often done, and again quite recently, by one of our ablest geologists, M. de Chancourtois.

Each of these meridians combines the fundamental conditions which geography demands and upon which there has always been an agreement when national meridians are set aside from the discussion. As to the determination of the position of the point which may be adopted, the present excellent astronomical methods will give it with a degree of exactness as great as that which geography requires.

But what is the necessity for a special and costly determination of the longitude of a point which can be fixed arbitrarily, provided this be done within certain limits, as for instance by satisfying the conditions of passing through a strait or an island? We may be content with fixing the position of the point adopted in an approximate manner. The position thus obtained would be connected with certain of the great observatories selected for the purpose from their being accurately connected one with another, and the relative positions thus ascertained would supply the definition of the first meridian. As to any material mark on the globe, if one be desired, though it is in no manner necessary, it would be established in conformity with this definition, and its position should be changed until it exactly complied with it.

As to the question of the changes to be introduced in existing maps and charts which, by our proposition, would be imposed upon everybody, they could be very much reduced, especially if it were agreed—which would be sufficient at first—to draw upon existing charts only a subsidiary additional scale of graduation which would permit immediate use of the international meridian. Later, and as new charts were engraved, a more complete scale of graduation would be given; but I think that it would always be desirable to preserve in the manner now done in many atlases both systems of reckoning longitude—the national and international. If it be necessary at the present time to facilitate the external relations of all nations, it is also well to preserve among

them all manifestations of personal life, and to respect the symbols which represent their traditions and past history.

Gentlemen, I do not propose to dwell upon the details of the establishment of such a meridian. We have only to advocate before you the principle of its acceptance.

If this principle be admitted by the Congress, we are instructed to say that you will find in it a ground for agreement with France.

Without doubt, on account of our long and glorious past, of our great publications, of our important hydrographic works, a change of meridian would cause us heavy sacrifices. Nevertheless, if we are approached with offers of self-sacrifice, and thus receive proofs of a sincere desire for the general good, France has given sufficient proofs of her love of progress to make her co-operation certain.

But we shall have to regret that we are not able to join a combination which to protect the interests of one portion of the contracting parties would sacrifice the more weighty scientific character of the meridian to be adopted, a character which in our eyes is indispensable to justify its imposition upon all, and to assure it permanent success.

Prof. J. C. ADAMS, delegate of Great Britain, stated that if he were allowed to offer a few observations upon the eloquent address made by his colleague, the representative of France, Mr. Janssen, he would remark that, so far as he could follow that discourse, it seemed to him to turn almost entirely on sentimental considerations; that it appeared to him that the delegate of France had overlooked one great point which was correctly laid down by the president in his opening address, viz, that one of the main objects to be kept in view in the deliberations of this Conference would be, how best to secure the aggregate convenience of the world at large—how we should choose a prime meridian which would cause the least inconvenience by the change that would take place. Of course, any change would necessarily be accompanied by a certain amount of inconvenience, but our object, as he understood it, was to take care that that inconvenience should be as small in its aggregate amount as possible.

He stated that if that were taken as the ground of consideration by this Conference, it appeared to him that the question was narrowed to one of fact rather than to be one of sentiment, which latter would admit of no solution whatever; for it was quite clear that if all the delegates here present were guided by merely sentimental considerations, or by considerations of *amour propre*, the Conference would never arrive at any conclusion, because each nation would put its own interests on a level with those of every other.

He added that if the Conference should be able to agree in the opinion that the adoption of one meridian (for his part he did not undertake to say what meridian) would be accompanied by a greater amount of convenience in the aggregate than the adoption of any other, he thought that this should be the predominant consideration in guiding the decision of this Conference, on the question referred to them, and it appeared to him that this is a consideration which the delegate of France has not put before this Conference, at least not in a prominent way. It is clear that the inconvenience caused to any one nation by the adoption of a new neutral meridian would not be lessened by the fact that all other nations would suffer the same inconvenience.

With respect to the question of a neutral meridian, Professor ADAMS wished to call the attention of the Congress to the fact that the delegates here present are not a collection of representatives of belligerents; that they are all neutral as men should be in a matter purely scientific, or

in any other matter which affects the convenience of the world at large, and that this Conference is not met here at the end of a war to see how territory should be divided, but in a friendly way, representing friendly nations.

He stated that he hoped the delegates would be guided in their decision by the main consideration, which was, What will tend to the greatest practical convenience of the world? That he need not address a word to the other part of the argument which he thought at first of commenting upon a little, for the delegate of the United States. Commander Sampson, who spoke first, had put his views so clearly before the Conference that he (Professor Adams) would not detain it longer.

He would add, however, that if the Conference is to take a neutral meridian they must either erect an observatory on the point selected, which might be very inconvenient if they should choose such a point as is alluded to by the delegate of France, or if some such place was not selected, we should merely have a zero of longitude by a legal fiction, and that would not be a real zero at all; that they would have to select their zero with reference to a known observatory, and that, for instance, supposing they took a point for zero 20° west of Paris, of course that would be really adopting Paris as the prime meridian; that it would not be so nominally, but in reality it would be, and he thought that we now-a-days should get rid of legal fictions as much as possible, and call things by their right names.

Mr. JANSSEN, delegate of France, said:

My eminent colleague, whose presence is an honor to this Congress, Professor Adams, thinks that I overlook too much the practical side of the question, namely, how a prime meridian can be established so at to cause the least inconvenience. He says that I pay too much attention to what he calls a question of sentiment, and he concludes by expressing the hope that all nations will lay aside their national pride and only be guided by this consideration: What meridian offers the greatest practical advantages? My reply is that I intend no more than Professor Adams to place the question upon the ground of national pride, but it is one thing to speak in the name of national pride and another to foresee that this sentiment common to all men may show itself, and that we should avoid conclusions likely to arouse it, or we may compromise our success. That is all our argument; and the history of the great nation to which Professor Adams belongs furnishes us with examples of considerable significence, for the French meridian of Ferro was never adopted by the English, notwithstanding its happy geographical situation, and we are still awaiting the honor of seeing the adoption of the metrical system for common use in England.

But let us put aside these questions which I would not have been the first to touch upon, and place ourselves upon the true ground of the importance of the proposed reform, which is the only one worthy of ourselves or of this discussion. We do not refuse to enter into an agreement on account of a mere question of national pride, and the statement of the changes and expenses to which we should have to submit in order to accomplish the agreement is a sufficient proof of this.

But we consider that a reform which consists in giving to a geographical question one of the worst solutions possible, simply on the ground of practical convenience; that is to say, the advantage to yourselves and those you represent, of having nothing to change, either in your maps, customs, or traditions—such a solution, I say, can have no future before it, and we refuse to take part in it.

Professor ABBE, delegate of the United States, stated that the dele-

gate of France, Mr. Janssen, had made a very important proposition to the Conference: that the meridian adopted should be a neutral one. He said that he had endeavored to determine what a neutral meridian is. On what principle shall the Conference fix upon a neutral meridian, and what is a neutral meridian? Shall it be historical, geographical, scientific, or arithmetical? In what way shall it be fixed upon? He looked back a little into the history of an important system adopted some years ago. France determined to give us a neutral system of weights and measures, and the world now thanks her for it. She determined that the base of this neutral system should be the ten-millionth part of a quadrant of the meridian. She fixed it by measurement, and to-day we use the meter as the standard in all important scientific work, but is that meter part of the neutral system? Is our metric system neutral? It was intended to be, but it is not; we are using a French system. Had the English, or the Germans, or the Americans taken the ten-millionth part of the quadrant of the meridian, they would have arrived at a slightly different measure, and there would have been an English, a German, and an American measure. We are using the French metric system. It was intended to be a neutral system, but it is a French system. We adopt it because it deserves our admiration, but it is not a neutral system. The various nations of the world might meet and agree upon some slight modification of this metric system which would agree with the results of all scientific investigations, and thus make it international instead of French; but we do not care to do that, and are willing to adopt one system, taking the standard of Paris as our standard. How shall we determine a neutral system of longitude? The expression "neutral system of longitude" is a myth, a fancy, a piece of poetry, unless you can tell precisely how to do it. He would vote for a neutral system if the French representatives can tell the Conference clearly how to decide that it is neutral, and satisfy them that it is not national in any way.

Mr. JANSSEN, delegate of France, said:

I perfectly understand the objection of my honorable colleague, Professor Abbe. He asks what is a nentral meridian, and adds that the meter itself does not appear to him to be a neutral measure, but to be a French measure. He relies upon the consideration that if the English, the Americans, and Germans, in adopting a definition of the meter, had measured it for themselves, they would have arrived each at a slightly different result, which would have given us an English, American, and German meter; nevertheless, he adds, we use the French meter, because we find it so admirable.

I would answer, first, that the meter, as far as a measure is derived from the dimensions of the earth, is not French, and it was precisely to take away this character of nationality that those who fixed the meter sought to establish it on the dimensions of the earth itself. What is French is the particular meter of our national archives, which exhibits a very slight difference from that which our actual geodesy would have given us. Also, I think that if, at the time of the adoption of the Convention du Mêtre, in which the nations of Europe participated, we had slightly changed the length of our standard to make it agree with the result of actual geodetic measurements, we should have done an excellent thing in depriving this measure of any shadow of nationality. I agree with my honorable colleague that if a few slight changes adopted by a common accord could perfect the metrical system, we French ought to have no motive for opposing it. We have the honor of having invented a system of measures which, being based upon con-

siderations of a purely scientific nature, has been accepted by all. Therefore, if it can be said with truth that the meter of the Archives of Paris is French (not intentionally, but because it bears the mark of an error of French origin), it is an international meter, by the same title the discovery of the satellites of Mars made by my friend, Prof. Asaph Hall, whom I have the pleasure of seeing here, is scientific and of a universal nature. The meter—equal to the ten-millionth part of the distance from the equator to the pole—is no more French than that distance itself, and, nevertheless, if the Americans, English, or Germans had measured it, they would each have arrived at a slightly different meter.

Now, my honorable colleague adds that a neutral meridian appears to him a myth, a fancy, a piece of poetry, so long as we have not exactly settled the method of determining it. I shall disregard the expressions which my honorable colleague has thus introduced into the discussion, because this discussion should be serious. It is plain that Professor Abbe did not thoroughly apprehend the explanations which I gave of the proper methods of fixing the initial meridian, and of the conditions which make a meridian neutral; but I return to them, since I am invited to do so. Our meridian will be neutral if, in place of taking one of those which are fixed by the existing great observatiories, to which, consequently, the name of a nation is attached, and which by long usage is identified with that nation, we choose a meridian based only upon geographical considerations, and upon the uses for which we propose to adopt it.

Do you want a striking example of what differentiates a neutral meridian from a national meridian? In order to avoid the confusion which existed in geography at the beginning of the seventeenth century, on account of the multiplicity of initial meridians then in use, a congress of learned men, assembled in Paris at the instance of Richelieu to select a new common meridian, fixed its choice on the most eastern point of the island of Ferro. This was a purely geographical meridian, being attached to no capital, to no national observatory, and consequently neutral, or, if you please, purely geographical. Later, le Père Feuillet, sent in 1724 by the Academy of Sciences to determine the exact longitude of the initial point, having given the figure 19° 55′ 3″ west of Paris, the geographer, Delisle, for the sake of simplicity, adopted the round number 20°, and, as I stated a little while ago, this alteration completely changed the character of this prime meridian. It ceased to be neutral, and became merely the meridian of Paris disguised, as has been truly said, and the English, notably, never adopted it. Here is the difference, gentlemen, between a neutral meridian and a national meridian.

And, parenthetically, you see, gentlemen, how dangerous it is to awaken national susceptibilities on a subject of a purely scientific nature. Now allow me to add that, if in 1633 it was possible to find a neutral meridian, a purely geographical meridian, an independent meridian, it may easily be done in 1884 if we wish to do so; and that a point chosen on purely geographical considerations, either in Behring's Strait or in the Azores, could be much better determined now than was possible to Father Feuillet in 1724, and could take the position which the meridian of Ferro would not have lost had it not been confounded with the meridian of Paris.

Prof. J. C. ADAMS, delegate of Great Britain, stated that he merely desired to refer to one subject touched on by the delegate of France, Mr. Janssen, whose opinion he thought could hardly be supported, and

that was that the question of longitude was purely one of geography. He desired to controvert that, and to hold that the question of longitude was purely one of astronomical observation. The difference of longitude between two places could not be determined by geodetic observations, because to do this you must take hypothesis as to the figure of the earth, and the figure of the earth is not a simple figure. You may take as hypothesis that the figure of the earth is spheroidal, and that the ratio of the axes is exactly defined. Now, in the first place, we are not agreed as to the exact ratio of the axes, nor are we agreed as to the exact figure of the earth. If an attempt is made to measure the difference of longitude between two points on the earth's surface, especially when they are a considerable distance from each other, it is necessary to depend upon astronomical observations. In attempting to deduce the difference of longitude from geodetic measures, you must assume that the true figure and dimensions of the earth are known, which is far from being the case. The theory that the prime meridian is a matter purely of a geographical nature is liable to the fatal objection that the determination of the difference of longitude between one place and the other is really the determination of the difference of time of the passage of a star across the meridian of the two places concerned. That is very definite. You observe the transit of the star at one place, and you observe the transit of the star at the other place, and by means of telegraphic communications you are able to determine their difference of longitude independent of the figure of the earth. He said, in conclusion, that he thought the honorable delegate of France was mistaken upon the main point which he had just referred to, if, indeed, he had rightly understood him.

M. JANSSEN, delegate of France, replied as follows:

I think that M. Adams entirely misunderstands me. I agree with him absolutely in thinking that longitudes cannot be determined, especially of places far apart, except by astronomical methods. Geodesy can only furnish it for short distances; in such cases, it is true, it supplies it with a degree of accuracy which meridional observations cannot attain. So, if the question be to determine rigorously the difference of longitude in time between two places on the earth at considerable distances apart, it becomes one of astronomy, because here it is astronomy which gives the quickest and most accurate solution. For these reasons, if, for instance, we should wish to connect a given observatory with a point situated on the other side of the ocean which had been chosen as the starting point of longitudes, it would become a question of astronomy. Astronomy here is an admirable instrument for the solution, but it should only be the instrument.

On the contrary, the question becomes geographical, if it be that of determining where it will be most convenient to fix the origin of terrestrial longitudes. If the question be, for instance, to select one or another point, in some one or other ocean, astronomy has nothing to do with it, and when it wishes to impose upon us one of its observatories to fulfill such a function it tends to give an inaccurate solution.

At first sight it may seem that any point might become a starting point for terrestrial longitudes, but when we study the question a little more we see there may be great advantages in choosing some one point in preference to some other. Hence it is that all geographers have agreed to place initial meridians, when possible, in the oceans.

The PRESIDENT stated that, in accordance with the decision of the Conference, he had sent to the scientists named by them invitations to a seat upon this floor. The chair sees several of these gentlemen here

to-day, notably one of the most eminent astronomers of this country, to whom his countrymen are always ready to do homage, Professor Newcomb, superintendent of the United States Nautical Almanac. If it be the pleasure of the Congress, the chair will now request Professor Newcomb to give us his views upon the resolution now under discussion.

No objection being made to the proposition of the president, Professor NEWCOMB arose and said:

That in reference to the remarks of the distinguished delegate of France, Professor Janssen, he would prefer, if the Conference would consent, to study his arguments more carefully when they should be in print.

He remarked that some points raised by that argument have been already replied to, and he wished now more particularly to request that Professor Janssen would define precisely what he meant by "a neutral meridian;" that he had partially answered this question in reply to Professor Abbe; but that there was a more fundamental point, one of practice, which must be brought in and kept in mind at every step, and which was raised by Commander Sampson's paper, to which he had listened with great interest. Commander Sampson held that it would be necessary to have a fixed observatory on the chosen prime meridian, but he (Mr. Newcomb) did not concur in that view, but rather agreed, to a limited extent, with what Professor Janssen had said on that question.

In choosing a meridian from which to count longitude, you meet a difficult problem. You have a point on the globe defined as the first meridian. This would be taken as the initial point of departure, and you are to determine the longitude of a certain place from that point. Now, doubtless, there is no other way to do this than to have an astronomical instrument and telegraphic communication. And if they choose the Azores or Behring's Strait, in neither case could they mount a transit instrument or have a system of telegraphic communication. Nor could we make a determination of longitude from a single fixed observatory in any case.

He then stated that it was impracticable under any circumstances to have an absolutely neutral prime meridian; that the definition of the prime meridian must practically depend upon subsidiary considerations, no matter where it might be located. In the practical work of determining longitudes a connection with the prime meridian cannot be made in each case. What is really determined is the longitude from some intermediate point, generally in the same country, and in telegraphic communication with the place whose longitude we wish to know. This intermediate point would, for the time, be the practical prime meridian. But the longitude of this point itself must always be uncertain. Science is continually advancing in accuracy, and we find that we continually need to correct the longitude of our intermediate meridian, and hence of all points determined from it. How can this difficulty of constantly changing longitudes be avoided? He replied that each system of connected longitudes must rest upon its own basis. It must be referred to an assumed prime meridian, and the measurements must be made from that even if it be found to be somewhat in error. If some such system had been adopted thirty or forty years ago, we would have avoided the confusion arising from the fact that the longitudes given on many maps do not refer at all to any absolute meridian. All that is known is that the astronomers determined the longitude of the place, and then the maps had to be corrected accordingly. The longitude of

one place would be determined from Cambridge, and perhaps in the neighborhood is another place determined from the observatory at Washington. In either case we know nothing of the longitude of Cambridge or Washington which the observer assumed in his calculations.

Generally, in determining longitude, the country adopts the principal place within its confines as a subsidiary prime meridian, and the assumed longitude of this place is necessarily selected somewhat arbitrarily. The longitude, for instance, of Washington was, thirty years ago, known to be nearly 5 hours 8 minutes and 12 seconds west from Greenwich. Had we adopted this difference by law, it would have amounted to choosing for our prime meridian a point 5 hours 8 minutes and 12 seconds east of Washington, whether we happened to strike the transit instrument at Greenwich or not. This would have fixed an assumed longitude for the Cambridge observatory and for all points within our telegraphic net-work. We should have had a practical system, which might, however, require to be corrected from time to time, if some slight error were found in the assumed longitude of Washington.

In the present state of astronomical observation these little errors are of no consequence except in some very refined astromical discussions. For all geographical and perhaps geodetical purposes the error may be regarded as zero, and it may be said, in regard to astronomical work, that it will always be independent of any meridian that might be chosen.

But even if this difficulty were avoided, he could not see how they could have any place which would come within the definition of a neutral meridian. Supposing they took the Azores, they belong to Portugal; then certainly they would have a Portuguese prime meridian, belonging to the Portuguese nation. Thus they would no longer have a neutral point, if he (Professor Newcomb) rightly understood the meaning of Professor Janssen.

He said that the delegate of Great Britain, Professor Adams, had expressed very clearly his (Professor Newcomb's) ideas, and the difficulty we have in meeting the propositions of the French delegates; that what he had said would apply very properly to any neutral meridian that might be chosen in accordance with the plans of Professor Janssen. Whatever that meridian might be, we must always assume for it a certain number of degrees from the capital of the country where the place to be determined is located, and then take that imaginary meridian instead of a real point on the surface of the globe.

It is true that this is perfectly practicable, and on that theory there might not be any necessity of having an astronomical observatory. But why we should go to this trouble and expense Mr. Janssen did not make very clear; his considerations were purely sentimental, as was remarked by the delegate of Great Britain, Professor Adams, and he (Professor Newcomb) did not see what advantage would be gained by a neutral meridian in preference to one fixed by convenience.

In order that a discussion may proceed, it is necessary to agree on a given basis from which to start, and it is extremely difficult to agree upon a basis if there ar· considerations of sentiment introduced, because such considerations are peculiar to each person.

He therefore wished to propose this question again to the delegate of France, namely, what advantages can we derive from fixing upon a neutral meridian?

Mr. JANSSEN, delegate of France, said:

Professor Newcomb asks me to point out the advantages of a neutral meridian. These advantages are of two kinds—they are of a geograph-

ical nature and a moral nature. Let us examine the first: By placing the initial meridian between Asia and America, we get away from the centers of population, which is almost indispensible in view of the change of dates. We divide the world into two parts, the Old World and the New. The advantage of drawing the prime meridian through the ocean has always been understood, and it was precisely for this reason that Marinus of Tyre, during the first century, placed it at the Fortunate Isles, west of the African continent. It is idle to urge the difficulty of fixing such a meridian as an objection. Astronomy is so far advanced in our day as to enable us to make this calculation with all desirable accuracy.

As to the methods of obtaining this meridian exactly, there are several. I have already spoken of them, but I return to the subject, since more details are desired. These methods fall under two principal heads. We can, and that is the ancient idea, choose some remarkable physical point—as, for instance, the extremity of an island, a strait, the summit of a mountain—and determine approximately the distance in longitude of this point from the points of reference, which are at present the observatories. This method, if all the precision that science can now attain is required, would be costly in certain cases. For the Azores the expense would be small, because of the proximity of the telegraphic cables; it would be much greater for Behring's Strait. On the hypothesis of the employment of this method, it would evidently be necessary to place our meridian at the Azores.

According to the other method, it is not the physical point which is fixed, but simply the distance of the assumed origin from the points of comparison. For example, admit that the general definition of our prime meridian was that it should pass through the middle of Behring Straits. To obtain its theoretical definition, we should obtain a position of this point, either by summary observations of the nature of hydrographic surveys, or by the aid of existing information, and the longitude thus obtained would be connected with the observatories best connected with each other. A list of the differences of longitude would become the definition of our meridian, and not the physical point in the sea which marks the exact middle of the strait. If, now, we absolutely wished for a physical point, we have the island of Saint Lawrence, which is cut towards its eastern part by such a meridian, and we could put a point of reference there, subject to the condition that the position of this point should conform to the definition, and that it should be removed, in one direction or the other, until it did conform to it. As to the very slight errors which might still affect the relative positions of the great observatories actually connected by electricity, they do not concern geography. If I am not mistaken, the eminent superintendent of the American Nautical Almanac acknowledges that we could thus avoid the difficulties which might result from the changes to which the perfecting of science would in the course of time give rise in the statement of longitudes.

In this manner the expense would be nothing or small. Thus, also, the meridian would be truly neutral, both by reason of its position in the ocean between the continents, and by reason of its definition, since the zero of longitude would then be so placed as to occupy a point not identified with any nation. This illustration appears to me to answer the demands of Professor Newcomb. I have taken it only for that reason, for I maintain no particular method, but only the principal of neutrality.

Finally, I must return again to those sentimental reasons which my

eminent and friendly opponents so often call to my attention. If I do not err, the very warmth of these interesting discussions shows me that the honor of being personally connected with a great reform touches us more than we are willing to admit, or than practical interests alone could effect.

Professor Adams himself supplies an illustration of this. He should remember the lively discussions of the English and French press on the occasion of the magnificent discovery of Neptune, and on the claims of the two illustrious competitors who were then the objects of universal admiration. If we go back in history, do we not see the friends of Newton and of Leibnitz equally contesting with asperity the discovery of the infinitesimal calculus. The love of glory is one of the noblest motives of men; we must bow before it, but we must also be careful not to permit it to produce bad fruits.

When our men of science sought, a hundred years ago, to determine a new measure of length, some one proposed the length of the seconds pendulum at Paris. This measure was rejected, because it introduced the idea of time in a measure of length, and also because it was peculiar to Paris, and because a measure acceptable to the whole world was desired. It is important not to introduce questions of national rivalries into a scientific reform intended to be accepted by all, and history shows us precisely on this question of prime meridians what active rivalries there are. There was a time when almost every nation which had a large observatory had a meridian, and that meridian was considered an object of national pride. There were the meridians of Paris, of Rome, of Florence, of London, and so on, and no nation was willing to abandon its meridian for that of another. If you please to adopt either the meridian of Greenwich, Washington, Paris, Berlin, Pulkova, Vienna, or Rome, our reform may be accepted for the moment, especially if it offers immediate advantages in economy; but it will contain within it a vice which will prevent its becoming definitive, and we are not willing to participate in action which will not be definitive.

Whatever we may do, the common prime meridian will always be a crown to which there will be a hundred pretenders. Let us place the crown on the brow of science, and all will bow before it.

Commander SAMPSON, delegate of the United States, said that he thought that the delegate of France, Professor Janssen, had explained very fully the advantages of a neutral meridian, but he thought that he had not explained how we are to determine the neutral meridian. He added that he quite agreed with Professor Adams and Professor Newcomb, that to establish a prime meridian it is necessary to refer its position to an astronomical observatory.

He stated further that if a meridian were selected passing through the Atlantic or Pacific Ocean, it must be referred to some initial point whose longitude is known, and the consequence of that would be, it seemed to him, that the prime meridian selected would still be dependent upon some national observatory, and that to select a meridian at random, without reference to any observatory, would lead to the utmost confusion, and, he had no doubt, would not be entertained by any one.

Professor JANSSEN, delegate of France. When my honorable colleague, Commander Sampson, reads the remarks which I have just made, he will see that I have very fully shown what characterizes a neutral or geographical meridian, as contradistinguished from those meridians, which, passing through capitals and observatories of different countries, bear the names of nations, whilst geographical meridians

bear geographical names, such as the meridian of Ferro, of the Azores, Behring's Strait, &c. Of course it would be necessary to connect the places selected with observatories, either by calculation or in some other effective manner. I said all this a few moments ago.

Mr. RUTHERFURD, delegate of the United States, then remarked that in addition to what had been said he would merely call attention to the fact that after that neutral point had been established it would cease to be a neutral meridian; that if the Azores be chosen, they belong to Portugal, and he did not know any island in the Pacific which would serve the purpose and at the same time not be subject to this objection; that perhaps Behring's Strait, mentioned by the French delegate, might be less objectionable than any other place. He added that it is absolutely necessary that there should be some means of determining the difference between this adopted place and the other places, or else no use could be made of it. We must know how far other places are from the prime meridian, and for that reason it is necessary that it should be on land. Now that land must belong to some country, and after we have fixed upon it it would cease to be a neutral meridian, and it would have to be connected by telegraphic wires with all the great observatories in the world.

Professor JANSSEN, delegate of France. My honorable friend, Mr. Rutherfurd, says that from the time the prime meridian was chosen it would cease to be neutral. I reply that he confounds a scientific principle with a question of property in the soil. If, for reasons of a geographical nature, we should fix upon a point in the Azores, that meridian would be neutral, because it would have been chosen on scientific grounds alone. The equator is neutral because geographical conditions give it that character; and, nevertheless, the countries along it belong to various nations, do they not? As to the manner of connecting the prime meridian with the system of observatories, I have already explained how this may be done in my former speech.

General STRACHEY, delegate of England, remarked that he had rather hesitated about saying anything on the subject, after the expression of so many opinions of persons better qualified to speak than himself, but he felt that he ought to make a few remarks as to the distinction which Professor Janssen had attempted to establish between astronomical and geographical longitude. It appeared to him that longitude was longitude. It would never do if, for geographic purposes, we are to have a second or third class longitude, and for astronomical purpose a first class longitude. He said that as a geographer he repudiated any such idea. When you come to the practical application of the determination of longitude at sea for maritime purposes, it is true that a much less accurate determination suffices than would suffice for the determination of longitude for astronomical observatories; but, for all that, what is the object of a ship desiring to know what its place at sea is? Obviously to arrive at the port to which it is destined, and the object to be attained is such a determination of the longitude as to enable that ship to arrive at its port without danger. You obtain a comparatively imperfect determination of longitude, but it is sufficiently accurate to prevent you from striking on the solid earth. But how is the longitude of the port to be determined? Certainly, as has been properly said, by astronomical observations, which can only be made with certainty on the earth. Consequently, it seemed to him that it is absolutely essential for fixing an initial meridian for the determination of longitude that it should be placed at an astronomical observatory which can be connected with other places by astronomical observations and

by telegraph wires, and that the idea of fixing a neutral meridian is nothing more than the establishment of an ideal meridian really based upon some point at which there is located an observatory. This has been repeated once or twice before, and I need not enlarge upon it.

Professor JANSSEN, delegate of France, said: As my honorable colleague, General Strachey, thinks that longitude is longitude, and that there is not an astronomical longitude and a geographical longitude, I answer that this is, nevertheless, what the nature of things indicates. The longitude of observatories, or rather the difference of longitude between those establishments, must be fixed with an accuracy which is never sufficiently great. In the Bureau of Longitude of France we are occupied with the differences of longitude of European observatories, and we adopt for these calculations all the latest scientific improvements, and especially the employment of electricity. Geography, especially for general purposes, does not require this great accuracy, which could not be expressed on maps. All geographers agree upon that subject. A statement of the longitude is like the statement of a weight, of a measure, or of anything, and its precision must vary according to the purpose to which it is applied. Is not a weighing necessary to determine a chemical equivalent of an entirely different kind from that of a commercial weighing? Yet it is still a weight. Is it necessary to insist on this further? It is entirely a secondary question. If General Strachey, whom I had the pleasure of meeting in India, demands that the prime meridian should be connected with observatories with rigorous accuracy, this can be done if it be desired; the astronomical and electrical methods at our disposal will permit of it.

Professor ABBE, delegate of the United States, said that he was quite interested in the determination, if possible, of what is a neutral meridian. We are precisely in the condition in which we were years ago, when the French Institute determined that the basis of the metric system should be the one ten-millionth of the quadrant of the globe. Having settled upon that ideal basis, they spent years of labor, and finally legalized a standard meter, which is still preserved at Paris. We have now the same problem to solve. We have before us the idea of a neutral meridian, and, if it be adopted, we must see that there be embodied in the system the distance of certain other important places with reference to it. The only suggestion given as to the location of this neutral meridian is Behring's Strait. This is said to be a neutral meridian, because it lies between Russia and America; but how long will it remain so? Perhaps a year or two, or perhaps fifty years. Who knows when Russia will step over and reconquer the country on this side of Behring's Strait? Who knows when America will step over and purchase half of Siberia? At any rate, that point is not cosmopolitan; something must be found which is fixed, either within the sphere of the earth or in the stars above the earth—something that is above all human considerations—otherwise we shall fail in securing a neutral meridian.

Commander SAMPSON, delegate of the United States, said that he would like to ask the delegate from France, Mr. Janssen, where he would place the neutral meridian.

The PRESIDENT said that the delegate of the United States, Commander Sampson, puts a question which seems to be somewhat categorical.

At this point in the proceedings the president stated that it would be convenient if the Conference would take a short recess to enable the secretaries, with himself, to consult upon the subject of the preparation and approval of the protocols.

A recess was thereupon taken.

After the recess, the delegate from France, Professor JANSSEN, presented the following resolution:

Resolved, That the decision upon the motion of the French delegates, in regard to the choice of a neutral meridian, be postponed to the next meeting of the Conference.

He said that as he must speak French, and as several of his colleagues could, perhaps, not entirely grasp the meaning of the discussion, he asked for the adjournment of the vote until the next meeting, so that the protocol of this meeting may be printed and distributed to the members of the Conference.

The PRESIDENT stated that as far as he understood this resolution it merely amounted to this: that no vote shall be taken upon the original resolution of the French delegate—namely, as to the adoption of a neutral meridian—until the next meeting of the Conference, when the protocols in both languages will have been printed and distributed.

Commander SAMPSON, delegate of the United States, inquired whether, if this resolution were adopted, it would be necessary to vote upon the original question at the next meeting.

The PRESIDENT replied that was not necessarily the case. The delegate of France simply desires that no vote shall be taken to-day. The original subject will come up and be open for debate at the next meeting, but it seemed to the chair that it should be as far as possible exhausted to-day, so that the delegates could have the whole matter before them at the next meeting.

Mr. LEFAIVRE, delegate from France, said that the arguments already presented will require time for careful consideration. Consequently he asked for the adjournment of the vote, and he hoped that none of his colleagues would object to it.

The PRESIDENT stated that he would venture to suggest, for the purpose of preventing delay, that so far as was possible any arguments that are to be offered should be made now, so that in the protocol of this day's proceedings, which will be of considerable length, these arguments may be incorporated.

Mr. RUSTEM EFFENDI, delegate of Turkey, stated that it would be impossible to prepare a proper protocol of this Conference without the assistance of a French stenographer, and he therefore suggested that such a stenographer be secured as early as possible.

The PRESIDENT stated that efforts had been made to obtain a French stenographer, but without success, and that if any delegate knows of such a stenographer and will communicate with the chair, it will be happy to take the necessary steps to secure his services.

Count LEWENHAUPT, delegate of Sweden, then made the following statement:

I beg to propose that the Conference adjourn at the call of the president; that the time and hour for the next meeting be communicated to the delegates twenty-four hours before the meeting, and that at the same time a proof-copy of the protocols of the present meeting be forwarded.

He added that, by giving the delegates twenty-four hours after the protocols are printed, time would be allowed them to revise the protocols and make such corrections as they thought necessary, and those corrections could be reported to the secretaries and made in the printed text. The protocol can then be finally and definitely printed and approved at the beginning of the next meeting of the Conference.

The proposition of the delegate of Sweden was then adopted.

The Conference then adjourned at 5 o'clock p. m., subject to the call of the president.

IV.

SESSION OF OCTOBER 13, 1884.

The Conference met, pursuant to adjournment, in the diplomatic hall in the State Department, at 1 o'clock p. m.

Present:

Austria-Hungary: Baron I. von Schæffer.
Brazil: Dr. Luiz Cruls.
Chili: Mr. F. V. Gormas and Mr. A. B. Tupper.
Colombia: Commodore Franklin.
Costa Rica: Mr. J. F. Echeverria.
France: Mr. A. LeFaivre and Mr. Janssen.
Germany: Baron H. Von Alvensleben and Mr. Hinckeldeyn.
Great Britain: Sir F. J. O. Evans, Prof. J. C. Adams, Lieutenant-General Strachey, and Mr. Sandford Fleming.
Guatemala: Mr. Miles Rock.
Hawaii: Hon. W. D. Alexander and Hon. Luther Aholo.
Italy: Count Albert de Foresta.
Japan: Professor Kikuchi.
Liberia: Mr. William Coppinger.
Mexico: Mr. Leandro Fernandez and Mr. Angel Anguiano.
Netherlands: Mr. G. de Weckherlin.
Paraguay: Capt. John Stewart.
Russia: Mr. C. de Struve, Major-General Stebnitzki, and Mr. J. de Kologrivoff.
San Domingo: Mr. M. de J. Galvan.
Spain: Mr. Juan Valera, Mr. Emilio Ruiz del Arbol, and Mr. Juan Pastorin.
Sweden: Count Carl Lewenhaupt.
Switzerland: Col. Emile Frey.
Turkey: Mr. Rustem Effendi.
Venezuela: Dr. A. M. Soteldo.
United States: Rear-Admiral C. R. P. Rodgers, Mr. Lewis M. Rutherfurd, Mr. W. F. Allen, Commander W. T. Sampson, and Prof. Cleveland Abbe.

Absent:

Denmark: Mr. C. S. A. de Bille.
Salvador: Mr. A. Batres.

The PRESIDENT. In view of the many communications addressed to the President of this Conference, having reference to the business before it, presenting statements and arguments in relation thereto, the chair asks that a committee be appointed, to which shall be referred all such communications, and that the committee be instructed to make such report upon them as it may deem advisable.

Count LEWENHAUPT, delegate of Sweden. I beg leave to propose to the Conference that the appointment of this committee be left to the president.

Mr. SOTELDO, delegate of Venezuela. I second the motion of the delegate of Sweden.

Mr. DE STRUVE, delegate of Russia. I entertain the same opinion, and I support the motion.

The motion was then unanimously adopted.

The PRESIDENT. I will name as the members of the committee the delegate of Great Britain, Professor Adams; the delegate of Germany,

Mr. Hinckeldeyn; the delegate of the United States, Professor Abbe; the delegate of Japan, Mr. Kikuchi; and the delegate of Costa Rica, Mr. Echeverria.

The PRESIDENT. After a discussion of only three hours this Conference adjourned a week ago to-day, subject to the call of its president. Owing to the want of a French stenographer to report the words that were spoken in French, there has been much delay in preparing the protocol, which has not yet been completed. Fortunately, an experienced French stenographer has been procured through the kind intervention of Mr. Sandford Fleming, of the delegation from Great Britain, and Mr. William Smith, deputy minister of marine for the Dominion of Canada. We may now hope to have a fairly accurate report of what is said, both in French and English, needing only slight verbal corrections, and the chair trusts that delegates may find it convenient to make the corrections very promptly, so that the protocols may be printed and verified as speedily as possible.

Should any delegate, who has not yet spoken, desire to address the Conference upon the resolution of the delegate from France, his remarks will now be received, and when the mover of the resolution shall close the debate, the vote will be taken, if such be the pleasure of the Conference.

Mr. SANDFORD FLEMING, delegate of Great Britain. I have listened with great attention and deep interest to the remarks which have fallen from the several gentlemen who have spoken, and I desire your kind indulgence for a few moments while I explain the views I have formed on the motion of the distinguished delegates from France.

I feel that the important question which this Conference has to consider must be approached in no narrow spirit. It is one which affects every nationality, and we should endeavor, in the common interest, to set aside any national or individual prejudices we possess, and view the subject as members of one community—in fact, as citizens of the world. Acting in this broad spirit, we cannot fail to arrive at conclusions which will promote the common good of mankind.

In deliberating on the important subject before us, it seems to me there are two essential points which we should constantly bear in mind:

1. We should consider what will best promote the general advantage, not now only, but for all future years, while causing at the present time as little individual and national inconvenience as possible.

2. We should, in coming to a determination on the main question for which this Conference is called, leave nothing undone to avoid offense, now or hereafter, to the sensitiveness of individual nations.

The motion is, that the initial meridian to be chosen should be selected on account of its neutrality. This undoubtedly involves the selection of an entirely new meridian, one which has never previously been used by any nation, as all initial meridians in use are more or less national, and, as such, would not be considered neutral in the sense intended by the honorable delegates from France.

Let us suppose that this Conference adopted the motion. Let us suppose, further, that we found a meridian quite independent of and unrelated to any existing initial meridian. Would we then have accomplished the task for which we are met? I ask, would the twenty-six nations here represented accept our recommendation to adopt the neutral meridian? I greatly fear that the passing of the resolution would not in the least promote the settlement of the important question before the Conference. The world has already at least eleven different first meridians. The adoption of the new meridian contemplated by

the delegates from France would, I apprehend, simply increase the number and proportionately increase the difficulty which so many delegates from all parts of the earth are assembled here to remove.

This would be the practical effect of the passing of the resolution. If it had any effect it would increase the difficulty, and I need not say that is not the object which the different Governments had in view when they sent delegates to this Conference. The president has well pointed out in his opening address the advantages which would be gained, and the great dangers which, at times, would be avoided by seafaring vessels having one common zero of longitude. Besides the benefits which would accrue to navigation, there are advantages of equal importance in connection with the regulation of time, to spring, I trust, from our conclusions.

It does not appear to me that the adoption of the motion would in any way advance these objects. I do not say that the principle of a neutral meridian is wrong, but to attempt to establish one would, I feel satisfied, be productive of no good result. A neutral meridian is excellent in theory, but I fear it is entirely beyond the domain of practicability. If such be the case, it becomes necessary to consider how far it would be practicable to secure the desired advantages by adopting as a zero some other meridian which, while related to some existing first meridian, would not be national in fact, and would have the same effect as a perfectly neutral meridian in allaying national susceptibilities.

The selection of an initial meridian related to meridians now in use gives us a sufficiently wide choice. Allow me to read the following list, showing the number and the total tonnage of vessels using the several meridians named, in ascertaining their longitude:

Initial meridians.	Ships of all kinds.		Per cent.	
	Number.	Tonnage.	Ships.	Tonnage.
Greenwich	37, 663	14, 600, 972	65	72
Paris	5, 914	1, 735, 083	10	8
Cadiz	2, 468	666, 602	5	3
Naples	2, 263	715, 448	4	4
Christiania	2, 128	695, 988	4	3
Ferro	1, 497	567, 682	2	3
Pulkova	987	298, 641	1½	1½
Stockholm	717	154, 180	1½	1
Lisbon	491	164, 000	1	1
Copenhagen	435	81, 888	1	½
Rio de Janeiro	253	97, 040	½	½
Miscellaneous	2, 881	534, 569	4½	2½
Total	57, 697	20, 312, 093	100	100

It thus appears that one of these meridians, that of Greenwich, is used by 72 per cent. of the whole floating commerce of the world, while the remaining 28 per cent. is divided among ten different initial meridians. If, then, the convenience of the greatest number alone should predominate, there can be no difficulty in a choice; but Greenwich is a national meridian, and its use as an international zero awakens national susceptibilities. It is possible, however, to a great extent, to remove this objection by taking, for a zero of longitude and time, the meridian farthest distant from Greenwich. This being on the same great circle as Greenwich, it would not require the establishment of a new observatory; its adoption would produce no change in charts or nautical tables, beyond the notation of longitude. It would possess all the advantage claimed

for the Greenwich meridian in connection with navigation, and as a zero for regulating time it would be greatly to be preferred to the Greenwich meridian. This Pacific meridian being accepted as the common zero, and longitude being reckoned continuously in one direction, there would be an end to the necessity of any nation engraving on its charts the words "longitude east or west of Greenwich." The one word "longitude" would suffice. The zero meridian would be international and in no respect national. Even on British charts all reference to Greenwich would disappear.

This view of the question is sustained by many distinguished men. I shall only ask permission to read the opinion of Mr. Otto Struve, director of the Imperial Observatory at Pulkova, than whom there is no higher authority:

The preference given to the Greenwich meridian was based, on one side, on the historical right of the Royal Observatory of England, acquired by eminent services rendered by this establishment during the course of two centuries, to mathematical geography and navigation; on the other side, considering that the great majority of charts now in use upon all the seas are made according to this meridian, and about 90 per cent. of the navigators of long standing are accustomed to take their longitude from this meridian. However, an objection against this proposition is, that the meridian of Greenwich passes through two countries of Europe, and thus the longitude would be reckoned by different signs in different portions of our own continent and also of Africa.

Moreover, the close proximity of the meridian of Paris, to which, perhaps, some French geographers and navigators of other nations would still hold to, from custom, from a spirit of contradiction or from national rivalry, might easily cause sad disaster. To obviate these inconveniences, I have proposed to choose as prime meridian another meridian, situated at an integral number of hours east or west of Greenwich; and among the meridians meeting this condition, I have indicated, in the first place, the meridian proposed to-day by scientific Americans, as that which would combine the most favorable conditions for its adoption. Thus the meridian situated 180° from Greenwich presents the following advantages:

1. It does not cross any continent but the eastern extremity of the north of Asia, inhabited by people very few in number and little civilized, called Tschouktschis.

2. It coincides exactly with that line where, after the custom introduced by a historical succession of maritime discoveries, the navigator makes a change of one unit in the date, a difference which is made near a number of small islands in the Pacific Ocean, discovered during the voyages made to the east and west. Thus the commencement of a new date would be identical with that of the hours of cosmopolitan time.

3. It makes no change to the great majority of navigators and hydrographers, except the very simple addition of twelve hours, or of 180° to all longitudes.

4. It does not involve any change in the calculations of the Ephemerides most in use amongst navigators, viz, the English Nautical Almanac, except turning mid-day into midnight, and *vice versa*. In the American Nautical Almanac there would be no other change to introduce. With a cosmopolitan spirit, and in the just appreciation of a general want, the excellent Ephemerides published at Washington record all data useful to navigators calculated from the meridian of Greenwich.

For universal adoption, as proposed by the Canadian Institute, it recommends itself to the inhabitants of all civilized countries, by reason of the great difference in longitude, thus removing all the misunderstandings and uncertainties concerning the question as to whether, in any case, cosmopolitan or local time was used.

In answer to the first question offered by the institute at Toronto, I would, therefore, recommend the Academy to pronounce without hesitation in favor of the universal adoption of the meridian situated 180° from Greenwich as prime meridian of the globe.

I quote from the report of Mr. Otto Struve to the Imperial Academy of Sciences of St. Petersburg September 30, 1880.

I respectfully submit, we have thus the means of solving the problem presented to us without attempting to find such a meridian as that contemplated in the motion of the honorable delegates. Whatever its origin, the Pacific meridian referred to would soon be recognized as being as much neutral as any meridian could possibly be. If, on the other hand, we adopt the motion, I very greatly fear that the great ob-

ject of this Conference will be defeated, and the settlement of a question so pregnant with advantages to the world will be indefinitely postponed.

Dr. CRULS, delegate of Brazil, said:

GENTLEMEN: Since the opening of this discussion more authoritative voices than mine—among others, that of the honorable Mr. Sandford Fleming, delegate of Great Britain, who has just expressed his opinion upon the question—have been heard upon the important subject which we are now called upon to discuss, and of which we should endeavor to find a full and final solution. The various aspects of the projected reform—viz, the unification of longitude, which numerous international interests recommend to our care—appear to me to have been examined, and that relieves me of the task of taking up again the question in its details, and permits me to abridge very much the considerations which I think it my duty to present in order to explain my vote. Up to the present moment we have settled one point, gentlemen, and it is one of great importance; that is, the necessity of adopting a common prime meridian. This point has obtained the support of all the delegates present at the Conference. This necessity being recognized, it is proper to take another step towards the solution of the problem presented to us, and to decide what that meridian shall be. It is this choice, gentlemen, which at this moment forms the subject of our discussion, and upon which we have to decide.

My honorable colleague, Mr. Rutherfurd, the delegate of the United States, has presented a motion proposing the adoption of the meridian of Greenwich, a motion which is again made, having been withdrawn temporarily from our discussion with the consent of its proposer. The motion which was presented at the last session, and which has formed the subject of numerous interesting discussions, is that made by my honorable colleague, Mr. Janssen, delegate of France, who proposes that the meridian adopted should have a neutral character, and should not cross either of the great continents of Europe or America. This proposition, gentlemen, has been strongly resisted by the delegates of Great Britain and the United States, and firmly maintained by the delegates of France, and the debates which followed gave us an opportunity of being present at a scientific tournament of the highest interest. The speakers whom we have had the honor of hearing seem to me to have exhausted all the arguments for and against, and at the present stage of the discussion I presume that these debates have permitted each one of us to form, with a full knowledge of the case, an opinion upon the question on which we are called to vote.

For my part, gentlemen, I desire to state clearly the attitude that Brazil, in my opinion, must take in this Conference. That attitude is one of absolute neutrality, inasmuch as the question is whether or not to choose a national meridian which may provoke among certain nations very legitimate rivalries. From the point of view only of the interests of Brazil, the choice of one meridian rather than any other is recommended to me by no consideration. Our local charts are referred to the nearest meridian, that of the observatory of Rio Janeiro, which is the point of departure in the geodetic or hydrographic operations in course of execution in Brazil, and which all are connected with that same meridian. The marine charts of the coast most in use are the result of hydrographic works executed by the commandant, Mouchez, now admiral and director of the Observatory at Paris. As to the telegraphic determination of the longitude of the observatory of Rio, we owe it to the American commission, directed by Commandant Green, of the United States Navy. Now, gentlemen, up to the day on which

the Conference met for the first time, I had hoped that these discussions, entered upon under the influence of a generous rivalry, and having for their only purpose the establishment of a measure, the necessity of which is strongly sought by many interests of a diverse nature, would lead to a complete and final solution of the problem. Unfortunately, and I regret to be obliged to add it, the differences of opinion which have manifested themselves in this Congress permit scarcely a hope of this result. For my part, gentlemen, I cannot lose sight of the fact that it is indispensable that the question for which this Congress is assembled should receive a complete settlement; if not, the purpose of the Congress will not be attained. Since the delegates of France have manifested from the beginning of our discussions their opposition to the adoption of any meridian which had a national character, which has given rise to the motion presented by Mr. Janssen, it follows that every measure voted by the Congress tending to the adoption of a national meridian will be, by the very fact of the abstention of France, an incomplete measure, and will not answer the purpose sought by the Conference. I hasten to add, in order to avoid all erroneous interpretations which could be given to my words, that it would be the same if, for instance, the meridian of Paris was proposed, and any great maritime nation, such as England, the United States, or any other, should abstain from voting for its adoption. In that case, also, the measure adopted would not be complete, and in that case, also, my line of conduct would be the same.

To resume, I would say that the great benefits that the whole world will receive from the adoption of a common prime meridian will not be fully produced unless the measure is unanimously accepted by all the most important maritime nations. In any other event, I am, for my part, absolutely convinced that the measure adopted will be partly inefficacious, its adoption not being general, and everything will have to be done over again in the not distant future. The discussions at which we have been present abundantly prove to me that it will always be so as long as the meridian of some great nation is proposed. In the face of this difficulty, which appears to me insurmountable, the only solution which, by its very nature, will not raise exciting questions of national pride is that of a meridian having a character of absolute neutrality. If the adoption of such a meridian was admitted in principle, I am certain that a discussion based upon pure science, and following the best conditions which it should realize, would conduct us rapidly to a practical settlement of the question.

In such a discussion the arguments which ought to prevail should be, before everything, drawn from science, the only source of truth which alone can enlighten us, so as to permit us to form a sound judgment, and to decide solely upon considerations of a purely scientific nature.

In addition to these considerations, I am not ignorant that there are others. I refer to questions of economy, of which it is necessary to take count. As to political interests, if there are any, our eminent colleagues who represent so worthily the diplomatic element in this assembly would see that they had due weight, and, thanks to this assembly of men, distinguished, some in science and others in diplomacy, there was every reason to hope that the final practical solution of the question which we are seeking would not be long in being made clear to us all by the discussions.

Moreover, this practical solution appears to me already to follow from what our honorable colleague, M. Janssen, has told us on that subject. The principle of the neutral meridian once adopted, there would still to

be discussed the conditions which it should fulfill and the determination of its position. Two things must be considered: either the meridan will be exclusively over the ocean, and then, by its very nature, it will be neutral, or it will cut some island, and in that case nothing would prevent an international diplomatic convention making neutral the plot of land on which it was desirable to establish an observatory, which would in reality be a very small matter. Of these two solutions, both of which satisfy the conditions which the meridian ought to fulfiil in its character of neutrality and by the requirements of science, I prefer the second. I wish merely to suggest by what I have said how it would be possible to arrive at a practical solution of the question, since now I am only speaking of the adoption of the principle of the neutral meridian.

I conclude, gentlemen, by declaring that I shall vote in favor of the adoption of a meridian with a character of absolute neutrality, and in doing so I hope to contribute my share to giving our resolutions such a character of independence as is necessary to make them generally acceptable in the future, and to unite in their support at present scientific men without distinction of nationality who are now awaiting our decision.

Professor JANSSEN, delegate of France, said:

GENTLEMEN: I have listened with a great deal of attention to the discourse of the delegate of England, Mr. Fleming, and if we had not had such an exhaustive discussion last session, at which, I believe, all the reasons for and against were given, I would certainly have asked permission to answer it. But I believe that on all sides we are sufficiently enlightened on the question, and I desire above all to declare that it is not our intention of making this debate eternal. It is now for you, gentlemen, to decide. I am the more inclined to act thus, as my honorable colleague, the delegate of Brazil, Dr. L. Cruls, who is an astronomer like myself, appears to me to have recapitulated the question with a loftiness of views and in such happy language, that in truth we may take his arguments as our own. Before concluding, I wish to thank my colleagues for the kind attention that they have been good enough to accord me.

The PRESIDENT. The question recurs upon the resolution offered by the delegates of France. The resolution is as follows:

Resolved, That the initial meridian should have a character of absolute neutrality. It should be chosen exclusively so as to secure to science and to international commerce all possible advantages, and especially should cut no great continent—neither Europe nor America.

The PRESIDENT. Is the Conference ready for the question?

No objection being made, the roll was called, with the following result:

Ayes.—Brazil, France, San Domingo.

Noes.—Austria, Chili, Colombia, Costa Rica, Germany, Great Britain, Guatemala, Hawaii, Italy, Japan, Liberia, Mexico, Netherlands, Paraguay, Russia, Spain, Sweden, Switzerland, Turkey, United States, Venezuela.

Twenty-one noes and three ayes.

The PRESIDENT. The resolution is therefore lost.

Mr. RUTHERFURD, delegate of the United States. Mr. President, in presenting again the resolution which was withdrawn by me to give place to the resolution offered by our colleagues from France, having taken the advice from several members of the Conference with whom I consulted, it was thought best to offer a system of resolutions which should be responsive to the mandate under which we act. With the view of

bringing the subject to the notice of all the members of the Conference, I caused copies of the resolutions which I hold in my hand to be sent to them.

I have since heard that it has been held that these resolutions had been irregularly so communicated; that is, that the communication was made in a semi-official manner. I beg to express an entire disclaimer of anything of that sort. It was merely my individual action, and I desired to give notice of certain resolutions, with the sole view of having them fully understood before we met and to save time. I hope, therefore, that this excuse and explanation will be understood and accepted.

These resolutions are founded, as far as may be, upon those adopted at Rome. They differ from them only in two points. In the counting of longitude the Conference at Rome proposed that it should take place around the globe in one direction. This counting was to be in the direction from west to east.

Very singularly, I find in the report of the proceedings of the Roman Conference no discussion on that subject. No questions were asked, nor were any reasons given, why it should be so counted, and yet it was an entire divergence from the usage of the world at that time. The wording of the resolution of the Conference at Rome is substantially this: that the counting of longitude should take place from the meridian of Greenwich in the single direction of west to east.

It being my desire to avail myself, as far as possible, of the work of the Conference at Rome, I consulted with my colleagues here, and found that there was a great diversity of opinion. In the first place, some said we have always counted longitude both ways, east to west and west to east. Shall we cease to do that? Those who claimed that it was a more scientific way to count all around the globe immediately differed on the direction in which the longitude should be counted. Without going into any argument as to which of these methods would be the best or most convenient, I propose, by the second resolution, that we should go on in the old way, and count longitude from the initial meridian in each direction.

One of the objects of the third resolution is to make the new universal day coincide with the civil day rather than with the astronomical day. In the Conference at Rome the universal day was made to coincide with the astronomical day. It seems to me that the inconvenience of that system would be so great that we ought to hesitate before adopting it. For us in America perhaps the inconvenince would not be so very great, but for such countries as France and England and those lying about the initial meridian, the inconvenience would be very great; for the morning hours would be one day, and the afternoon hours would be another day. That seems to me to be a very great objection.

It was simply, therefore, to obviate this difficulty that this resolution was offered. I hope, notwithstanding, that some day, not far distant, all these conflicting days—the local, the universal, the nautical, and the astronomical—may start from some one point. This hope I have the greater reason to cherish since I have communicated with the distinguished gentlemen who are here present, and it was with that hope before me that I framed the resolution so that the beginning of the day should be the midnight at the initial meridian and not the midday. With this explanation, I now again move the adoption of the first resolution, which is as follows:

Resolved, That the Conference proposes to the Governments here represented the adoption of the meridian passing through the center of the transit instrument at the Observatory of Greenwich as the initial meridian for longitude.

The PRESIDENT. The Conference has heard the resolution. Any remarks are now in order.

Mr. SANDFORD FLEMING, delegate of Great Britain. I think, sir, the resolution goes a little too far at a single leap. I beg leave, therefore, to move an amendment in harmony with the resolution, at the same time leaving it to be settled by a subsequent resolution whether the zero be at Greenwich or at the other side of the globe.

That a meridian proper, to be employed as a common zero in the reckoning of longitude and the regulation of time throughout the world, should be a great circle passing through the poles and the center of the transit instrument at the Observatory of Greenwich.

Professor ADAMS, delegate of Great Britain. Mr. President, I desire merely to state, in reference to the amendment brought forward by one of our delegates, that the remaining delegates of Great Britain are by no means of the opinion expressed in that amendment, and that it is their intention, if it should come to a vote, to vote against it.

The proposition to count longitude from a point 180 degrees from the meridian of Greenwich appears to them not to be accompanied by any advantage whatever, On the contrary, it must lead to inconvenience. You do not, by adopting the meridian opposite Greenwich, get rid of the nationality of the meridian. If there is objection to the meridian of Greenwich on account of its nationality, the meridian of 180 degrees from Greenwich is subject to the same objection. The one half is just as national as the other half.

The PRESIDENT. The chair would say that no specific meridian is mentioned in the amendment.

Professor ADAMS, delegate of Great Britain. That is true; but, at the same time, it should be said that the meridian described is ambiguous. It is the meridian that passes through the poles and the center of the transit instrument of the Observatory of Greenwich. That is the language of the amendment. But it is intended to apply to only one-half of the great circle passing through the poles; that is, to the distant half of the meridian rather than to the nearer half. Unless it defines which half it is intended to take, the amendment is ambiguous, and it is not proper to be voted on.

Mr. MILES ROCK, delegate of Guatemala. Mr. President, it may be well to hear the words of the original resolution, in order that we can clearly see the relation of the amendment to that resolution.

The original resolution of the delegate of the United States was then read.

Baron VON ALVENSLEBEN, delegate of Germany. Mr. President, I think that in this amendment offered by the delegate of Great Britain two questions are mixed up together. The first thing for us to do is to fix upon a prime meridian; the second thing to settle is the question whether the adoption of a universal day is desirable or not. If we adopt this amendment, these two questions are involved in one vote. Therefore I think that they should be divided, for they are not appropriate in the form in which they are presented.

Mr. VALERA, delegate of Spain. I ask permission to speak, in order to explain my vote. The Government which I represent here has told me to accept the Greenwich meridian as the international meridian for longitudes, but I think it my duty to say, though the question does not arise in this debate, that Spain accepts this in the hope that England and the United States will accept on their part the metric system, as she has done herself. I only wish to state this, and I have no inten-

tion of making it a subject of discussion. I shall only add that I believe Italy is similarly situated with Spain in this matter.

The PRESIDENT. The chair would say, with great deference to the distinguished delegate from Spain, that the question of weights and measures is beyond the scope of this Conference. The invitation given by the Government of the United States to the nations here represented was for a distinct and specific purpose, the selection of a prime meridian, a zero of longitude throughout the world and a standard of time-reckoning. So far as the chair is informed, it would not be in order at this Conference to discuss a question of metric system.

Mr. JUAN VALERA, delegate of Spain. My only intention in making these remarks was to verify a fact. I know very well that we have not to discuss that question. Besides, the Government which I represent expresses only a hope, and I know we do not insert any hopes in our protocols; but I thought it my duty to make this declaration.

Mr. LEFAIVRE, delegate of France. I desire to make some remarks on the question when it is put to a vote; for the time being I shall only say a few words on the remarks of my honorable colleague, the delegate of Spain, Mr. Valera. I believe that, though the question of weights and measures is not before the conference, it is allowable for a member to state, in the name of his Government, the conditions to which his vote has been subordinated. Even though the question is not under discussion, it may appear from such an explanation that the vote is conditional, instead of being a simple affirmation. If my honorable colleague has received from his Government instructions to subordinate his vote to such or such a condition, even when the question to which it is subordinated is not submitted to the Conference, it follows from it, according to me, and everybody will admit it, that the consequences of that vote are at least conditional.

Mr. VALERA, delegate of Spain. My Government has charged me to express here its hopes and desires, but the vote which I have given is not, in my opinion, conditional; for I have received instructions to pronounce in favor of the Greenwich meridian to measure the degrees of longitude. However, it was necessary for me to say at the same time that it was with the hope that England and the United States would adopt the French weights and measure.

General STRACHEY, delegate of Great Britain. While I entirely agree with the view which the chair has taken of the question whether the adoption of metrical weights and measures is before this Conference—namely, that it is beyond our competence to discuss it—yet I am glad to have the opportunity of saying that I am authorized to state that Great Britain, after considering the opinions which were expressed at Rome, has desired that it may be allowed to join the Convention du Métre. The arrangements for that purpose, when I left my country, were either completed, or were in course of completion; so that, as a matter of fact, Great Britain henceforth will be, as regards its system of weights and measures, exactly in the same position as the United States.

In Great Britain the use of metrical weights and measures is authorized by law. Contracts can be made in which they are used, and the department which regulates the weights and measures of Great Britain is charged, consequently, with the duty of providing properly authenticated standard metric weights and measures for purposes of verification. It is quite true that the Government of England does not hold out any expectation that she will adopt the compulsory use of the metric system, either at the present time, or, so far as that goes, at any future

time; but it is a well-known fact—and in saying this I shall be supported, I have no doubt, by the views of the eminent scientific men of my own country who are here present—that there is a strong feeling on the part of scientific men of England that, sooner or later, she will be likely to join in the use of that system, which, no doubt, is an extremely good one, and which, so far as purely scientific purposes are concerned, is largely in use at the present time.

Mr. VALERA, delegate of Spain. I desire to thank the honorable delegate of England, General Strachey, for the friendly words which he has just pronounced, and to felicitate myself for having manifested the desire and hope of my Government that England should accept the weights and measures which have been accepted in Spain and in other parts of the European continent.

Mr. LEFAIVRE, delegate of France. Mr. Chairman, I cannot pretend to make any suggestion of any technical value on the question now before us. I only rise to add a few words to the views which have been so authoritatively expounded to you by Professor Janssen, in order to explain clearly the situation of the French Government in this important discussion. It is henceforth evident, after the instructive debate at which we have just assisted, that the meridian of Greenwich is not a scientific one, and that its adoption implies no progress for astronomy, geodesy, or navigation; that is to say, for all the branches and pursuits of human activity interested in the unification at which we aim.

Thus, science is absolutely disinterested in the selection which we are now discussing, and that fact I wish to emphasize particularly, as we are about to take a vote which we can easily anticipate by the one we had a few minutes ago, in order that the opponents of the resolution may not be accused of obstructing progress and the great aims of science for private interests.

If, on the contrary, any conclusion is to be drawn from the instructive debate at which we have assisted, it is that the principal, I will say more, the only merit of the Greenwich meridian—and our colleague from Great Britain just now reminded us of it by enumerating with complacency the tonnage of British and American shipping—is that there are grouped around it interests to be respected, I will acknowledge it willingly, by their magnitude, their energy, and their power of increasing, but entirely devoid of any claim on the impartial solicitude of science. To strengthen my assertion, gentlemen, I fall back upon the arguments brought forward by Mr. Hirsch in his remarkable report to the Geodetic Conference at Rome, arguments that evidently carried the vote of that assembly.

The Greenwich meridian, says that report, corresponds to an empire that embraces 20,000,000 square kilometers and a population of 250,000,000. Her merchant marine, which counts 40,000 ships of a tonnage from 6,000,000 to 9,000,000 tons, and crews of 370,000 men, surpasses in importance all the other marines put together. Other states, equally important by their merchant marine, especially the United States, make use of the Greenwich meridian. Well, gentlemen, if we weigh these reasons, the only ones that have been set forth, the only ones that at present militate for the Greenwich meridian, is it not evident that these are material superiorities, commercial preponderances, that are going to influence your choice? Science appears here only as the humble vassal of the powers of the day to consecrate and crown their success. But, gentlemen, nothing is so transitory and fugitive as power and riches. All the great empires of the world, all financial, in-

dustrial, and commercial prosperities of the world, have given us a proof of it, each in turn.

So long as there are not in politics or commerce any scientific means by which to fix, to enchain fortune, I see no reason to fix, to enchain, to subordinate, so to say, science to their fate.

The character of the proposed determination of the initial meridian is so evident that the reporter of the Conference at Rome, Mr. Hirsch, admits it implicitly; for, recognizing that the adoption of the meridian of Greenwich is a sacrifice for France, he asks that England should respond by a similar concession by favoring the definitive adoption of the metric system, and by acceding to the convention of the meter which furnishes to all states metric standards rigorously compared. Thus Mr. Hirsch, in a spirit of justice, wished to make for each a balance of profit and loss, evident proof that the question was of a commercial and of no scientific advantage. I am not aware, and my mission is not to discover, whether the bargain might have been accepted by France. However, it is with great pleasure that I heard our colleague from England declare that his Government was ready to join the international metric convention; but I notice, with sorrow, that our situation in this Congress is not as favorable as that of Rome, since the total abandonment of our meridian is proposed without any compensation.

At Rome the adoption of the metric system of weights and measures, of which France had the glorious initiative, was held out to us; but here we are simply invited to sacrifice traditions dear to our navy, to national science, by adding to that immolation pecuniary sacrifices.

We are assuredly very much flattered that there should be attributed to us sufficient abnegation to elevate us to that double heroism. We wish that we were able to justify such a flattering opinion, and especially we should like to be encouraged by examples. There are at this very moment magnificent transformations to be realized for the progress of science, and of the friendly relations of nations—unification of weights and measures, adoption of a common standard of moneys, and many other innovations of a well-recognized utility, infinitely more pressing and more practical than that of meridians. When the discussion of these great questions is begun, let each nation come and bring its share of sacrifices for this international progress. France, according to her usage—I may say so without vain glory as without false modesty—France will not remain behind. For the present we decline the honor of immolating ourselves alone for progress of a problematic and eminently secondary order; and it is with perfect tranquillity of conscience that we declare that we do not concur in the adoption of the meridian of Greenwich, persuaded as we are that France does not incur the reproach of retarding and of obstructing the march of science by abstaining from participating in this decision.

The PRESIDENT. Unless some other delegate desires to speak, the question will be put upon the amendment of the delegate of Great Britain, Mr. Fleming.

The question was then put; and the amendment was lost.

The PRESIDENT. The chair sees upon the floor to-day, as the guest of this Conference, one of the most distinguished scientists, who was invited to be present at our meetings, Sir William Thomson, whose name is known the world over in connection with subjects kindred to this we are now discussing. If it be the pleasure of the Conference to ask Sir William Thomson briefly to express his views, the chair would be very happy to make the invitation.

The chair, hearing no dissent, takes pleasure in introducing Sir William Thomson.

Sir WILLIAM THOMSON. Mr. President and gentlemen, I thank you for permitting me to be present on this occasion, and I thank you also for giving me the opportunity of expressing myself in reference to the subject under discussion. I only wish that the permission which you have so kindly given me may conduce to the objects of this Conference more than I can hope any words of mine can do.

The question immediately under discussion is, I understand, the proposal that the meridian passing through the center of the instrument at the Observatory of Greenwich shall be adopted as the initial meridian of longitude, and it does seem to me that this is a practical question; that this resolution expresses a practical conclusion that it is expected by the world the present Conference may reach. It is expected that the resolutions adopted will be for the general convenience, and not for the decision of a scientific question. It is the settlement of a question which is a matter of business arrangement. The question is, What will be most convenient, on the whole, for the whole world?

It cannot be said that one meridian is more scientific than another; but it can be said that one meridian is more convenient for practical purposes than another, and I think that this may be said pre-eminently of the meridian of Greenwich.

I do most sincerely and fervently hope that the delegates from France and from the other nations who voted for the preceding resolution will see their way to adopt the resolution that is now before the Conference. It does seem to me that it is a question of sacrifice, and I do trust that the honorable delegate from France who spoke last, Mr. Lefaivre, will see that France is not being asked to make any sacrifice that it was not prepared to make.

In the admirable and interesting addresses which Mr. Janssen has givento this Conference (which I had not the pleasure or satisfaction of hearing, but which I have read with great interest) the readiness of France to make a much greater sacrifice than that which is now proposed was announced. The amount of sacrifice involved in making any change from an existing usage must always be more or less great, because it cannot be said that it is a matter of no trouble to make such a change; but what I may be allowed to suggest is that the sacrifice which France was ready to make would be very much greater than that which would be made by adopting the resolution now pending.

If the resolution for a neutral meridian had been adopted, all nations would have to make the sacrifice necessary for a change to a meridian not actually determined, and the relations of which could not be so convenient with those meridians already adopted as are the relations between the meridians now in use with that of Greenwich. It does seem to me that if the delegates of France could see their way to adopt this resolution, they would have no occasion whatever to regret it.

I sympathize deeply with what has been said in regard to a common metrical system. I have a very strong opinion upon this subject, which I will not express, however, if it meets any objection from the chair; but it seems to me that England is making a sacrifice in not adopting the metrical system. The question, however, cannot be put in that way. We are not here to consider whether England would gain or lose by adopting the metrical system. That is not the way to view this question at all, because whether England should adopt the metrical system is a matter for its own convenience and use, and whether it adopts it

or not, other nations are not affected by its course. It would not at all be for the benefit or the reverse of other nations.

The PRESIDENT. The chair would be very glad to hear Sir William Thomson's views on this subject if it were before the Conference for discussion, but it is not.

Sir WILLIAM THOMSON. I beg pardon for having mentioned it.

I would repeat that the adoption of the meridian of Greenwich is one of convenience. The difference of other meridians from it is readily ascertained, and therefore it seems to me that the minimum of trouble will be entailed on the world by the general adoption of the meridian of Greenwich. This would require the minimum of change, and furthermore, the changes which would be necessary are already wholly ascertained.

I would inquire of the chair whether it would be in order for me to allude to the resolutions number 2 and 3, which have been read.

The PRESIDENT. I think that we must confine ourselves to the subject immediately under discussion, the adoption of a prime meridian.

Sir WILLIAM THOMSON. Then I have only to thank you and the delegates for allowing me to speak, and to express my very strong approbation of the resolution that has been proposed.

Sir F. J. O. EVANS, delegate, of Great Britain, then made the following remarks:

In view of the interesting information furnished to the Congress by M. Janssen on the hydrographic labors of France, past and present, and of the results as represented by the number of Government charts, it has appeared to myself—as having held the office of hydrographer to the Admiralty of Great Britain for many years—in which opinion I am supported by my colleagues, that I should place at the disposal of the Congress certain statistical facts bearing on the great interests of navigation and commerce, as illustrated by the number of marine charts, of sailing directions, and of nautical almanacs annually produced under the authority of the British Government, and of their distribution.

I would wish to disclaim any comparison in this respect with the labors of other countries. From personal knowledge I am aware that all nations—with only one or two exceptions—are, and especially so in the last few years, diligent in the development of hydrography, and that a cordial interchange of the results unfettered by any conditions is steadily being pursued.

With this preface I would lay before you the following statements, observing that the shores of the whole navigable parts of the globe are embraced in the series of Admiralty charts referred to:

The number of copper chart plates in constant use is between 2,850 and 2,900. This number keeps up steadily. About 60 new plates are added every year.

Average number of copper plates annually receiving correction amount to 2,700.

Total number of charts annually printed for the daily use of the ships of Her Majesty's fleet in commission, and for sale to the general public, has for some years ranged between 180,000 and 230,000.

The sale of Admiralty charts to the public through an authorized agent, both in London and at other commercial ports in the Kingdom, has been for the last seven years as follows:

1877	104,562
1878	109,881
1879	103,943
1880	114,430
1881	118,542
1882	131,801
1883	157,325

Of these numbers, about one-fifth have been purchased by the Governments or agents of Austria, France, Germany, Italy, Russia, Turkey, and the United States. The appended list, which was furnished to me by the Admiralty chart agent during the present year, gives the more precise particulars:

Years.	France.	Germany.	United States.	Italy.	Russia.	Turkey.	Austria.	Total.
1877	2,039	5,184	2,057	1,518	11,763	.....	.....	22,561
1878	5,741	3,351	2,641	2,645	5,551	.....	600	20,529
1879	3,340	6,425	5,185	802	9,354	.....	641	25,747
1880	5,793	5,280	1,879	797	10,145	519	375	24,788
1881	4,418	3,640	1,273	2,694	3,406	1,160	996	17,587
1882	7,454	5,656	1,716	2,569	4,245	115	1,197	22,952
1883	5,592	7,882	6,174	2,507	6,280	2,368	2,158	32,961
1884 (1st quarter) ..	1,367	2,261	2,942	908	2,186	429	577	10,670
	35,744	39,679	23,867	14,440	52,930	4,591	6,544	177,795

But the chart resources of the British Admiralty, great as they are, do not suffice to meet the requirements of the smaller class ships of the mercantile marine of Great Britain. There are three commercial firms in London who publish special charts, based, however, on Admiralty documents, to satisfy this demand. On inquiry I found that these firms publish 640 charts, which, from their large size, require about 930 copper plates. I am not able to furnish the number of charts sold by these firms, but it is large.

Supplementary to the Admiralty charts, there are 51 volumes of Sailing Directions. Several of these volumes exceed 500 pages, and have passed through several editions. Private commercial firms also, in addition to their charts, publish directions for many parts of the globe. These include regions with which the Admiralty have not yet, notwithstanding great diligence, been able to deal.

The annual sale of nautical almanacs for the past seven years has been:

1877	18,439
1878	16,408
1879	16,290
1880	14,561
1881	15,870
1882	15,071
1883	15,535

I think, sir, that these are salient points, which will assist the Conference in coming to a clearer view of the great interest which navigation and commerce have in the charts of a particular country.

Mr. W. F. ALLEN, delegate of the United States. Mr. President, the establishment of a prime meridian has, from the force of circumstances, become of practical importance to certain interests entrusted with vast responsibilities for the safety of life and property. These interests bear an important relation to the commerce of the world, and especially to the internal commerce of an extent of country embracing within its limits about sixty-five degrees of longitude. Exactness of time reckoning is an imperative necessity in the conduct of business.

On November 18, 1883, the several railway companies of the United States and the Dominion of Canada united in the adoption of the mean local times of the seventy-fifth, ninetieth, one hundred and fifth, and one hundred and twentieth meridians, west from Greenwich, as the standards of time for the operation of their roads. The system under

which they have since been working has proved satisfactory. They have no desire to make any further change. A large majority of the people in the several sections of the country through which the railways pass have either by mutual consent or special legislation adopted for their local use, for all purposes, the standards of time employed by the adjacent roads. Upon the public and working railway time-tables generally the fact has been published that the trains are run by the time of the seventy-fifth or ninetieth, &c., meridians, as the case may be.

The same standards are used by the railway-mail service of the United States Post-Office Department, which had previously used Washington time exclusively for through schedules.

It will at once be apparent how undesirable any action would be to the transportation interests of this country which should so locate the prime meridian as to require these time-standard meridians to be designated by other than exact degrees of longitude. That these standard meridians should continue to be designated as even multiples of fifteen degrees from Greenwich is regarded as decidedly preferable. To change to different standards, based upon exact degrees of some other prime meridian, would require an amount of legislation very difficult to obtain.

At a convention of the managers of many important railway lines which control through their connections fully three-fourths of the entire railway system of this country, held in Philadelphia, on October 9, 1884, certain action was taken, of which I have the honor to present a duly-attested copy:

At a meeting of the General Railway Time Convention, held in Philadelphia, October 9, 1884, the following minute was unanimously adopted:

Whereas an International Conference is now in session at Washington, D. C., for the purpose of fixing upon a prime meridian and standard of time-reckoning; and

Whereas the railway companies of the United States and Canada have adopted a system of time standards based, respectively, upon the mean local times of the 75th, 90th, 105th, and 120th meridians west from Greenwich, and this system has proved so satisfactory in its working as to render any further change inexpedient and unnecessary; therefore

Resolved, That it is the opinion of this convention that the selection of any prime meridian which would change the denomination of these governing meridians from even degrees and make them fractional in their character would be disturbing in no small measure to the transportation lines of the United States and Canada.

Resolved, That a duly-attested copy of these resolutions be presented to the Conference.

P. P. WRIGHT, *Chairman*.

Attest:

HENRY B. STONE,
Secretary pro tempore.

The question was then put on the adoption of the resolution offered by the delegate of the United States, Mr. Rutherfurd, as follows:

That the Conference proposes to the Governments here represented the adoption of the meridian passing through the transit instrument at the Observatory of Greenwich as the initial meridian for longitude.

The roll was called, and the different states voted as follows:

In the affirmative: Austria, Chili, Costa Rica, Colombia, Germany, Great Britain, Guatemala, Hawaii, Italy, Japan, Liberia, Mexico, Netherlands, Paraguay, Russia, Spain, Sweden, Switzerland, Turkey, Venezuela, United States.

In the negative: San Domingo.

Abstaining from voting: Brazil, France.

The result was then announced, as follows:

Ayes, 21; noes, 1; abstaining from voting, 2.

The PRESIDENT then announced that the resolution was passed.

Mr. DE STRUVE, delegate of Russia. In the name of the delegates for Russia I have now, at this point of the discussion, to say a few words.

If we had to consider the scientific side alone of the questions, which have already been discussed and resolved by the prominent scientists of the different countries at the general Conference of the International Geodetical Association at Rome, in 1883, we might as well simply adhere to the resolutions of the Roman Conference, and limit our work to the shaping of these resolutions into a form of a draft of an international convention, to be submitted for approbation to our respective Governments. But, as we have, besides, to consider the application of the intended reform to practical life, we beg to submit the following suggestions to the kind attention of the Conference.

It is important to find for the more densely populated countries the simplest mode possible of transition from local to universal time, and *vice versa;* and we believe, therefore, that it would be convenient for the practical purposes of the question to adopt for the beginning of the universal day the midnight of Greenwich, and not the noon, as was deemed advisable by the Conference of Rome.

This modification would offer for the whole of Europe and for the greatest part of America the advantage of avoiding the double date in local and universal time during the principal business hours of the day, and would afford great facilities in the transition from local time to universal.

In adopting the universal time for the astronomical almanacs and for astronomical ephemerides, and in counting the beginning of the day from the midnight of Greenwich, there would be, it is true, a modification of the astronomical chronology, as heretofore used; but we think it easier for the astronomers to change the starting point, and to make allowance for these 12 hours of difference in their calculations, than it would be for the public and for the business men, if the date for the universal time began at noon, and not at midnight.

The Conference at Rome proposes to count the longitudes from 0° to 360° in the direction from west to east. It seems to us that this system can lead to misunderstanding in the local and universal chronology for the countries beyond the 180° east of Greenwich.

We believe that a more practical result of the reform could be easily obtained by modifying the Clause IV of the resolutions of the Roman Conference, and by maintaining the system already in use for a long time, which is to count the longitudes from 0° to 180° to east and west, adopting the sign + for eastern longitudes, and the sign — for western longitudes. Thus the transition from universal to local time could be exactly expressed by the formula:

Universal time = local time — longitude.

The adoption of this modification would necessitate that the change of the day of the week, historically established on or about the antimeridian of Greenwich, should henceforth take place exactly on that meridian.

We are in favor of the adoption of the universal time (Clause V of the resolutions of the Roman Conference) side by side with the local time, for international telegraphic correspondence, and for through international lines by railroads and steamers.

We fully accept the resolution of the Roman Conference concerning the introduction of the system of counting the hours of the universal day from 0 to 24, and we think it desirable that the same system should be introduced for counting the hours in ordinary life. This would

greatly contribute to the disappearance of the arbitrary division of the day into two parts, a. m. and p. m., and to an easier transition from local to universal time.

We think it advisable to mark on all general maps the meridians in time as well as in degrees of longitude, which would render the reform familiar to the public, and facilitate its introduction in the education of the young.

On maritime charts the longitudes ought to be given in degrees, as these are necessary for the determination of distances in maritime miles.

The topographical maps may maintain temporarily their national meridian, in consequence of the difficulties of the modification of the co-ordinates for plates already engraved, but it would be necessary to mark on every sheet the difference between the national and the initial universal meridian in degrees of longitude.

It would be most desirable to have in all new geographical catalogues of astronomical and geodetical points the longitudes given in degrees as well as in time, and that in these new catalogues the new initial meridian be taken as the starting point for the longitudes.

The PRESIDENT. The chair has listened with great interest and pleasure to the paper which has just been read by the delegate of Russia, Mr. de Struve; but the chair begs to state that there is no resolution before the Conference.

The PRESIDENT. The chair will now direct the second resolution to be read.

The resolution was read, as follows:

> From this meridian (*i. e.*, the meridian passing through the center of the transit instrument at the observatory at Greenwich) longitude shall be counted in two directions up to 180 degrees, east longitude being plus and west longitude minus.

Mr. RUTHERFURD, delegate of the United States. Mr. President, in submitting this resolution to the Conference, I wish to say that the remarks of the delegate of Russia have increased my confidence in the belief of its propriety.

Count LEWENHAUPT, delegate of Sweden. Mr. President, I propose as an amendment to the resolution just offered the fourth resolution adopted by the Congress at Rome:

> It is proper to count longitude from the meridian of Greenwich in one direction from west to east.

Baron H. VON ALVENSLEBEN, delegate of Germany. Mr. President, I beg to state that I think that this is only a question of detail; and if the question is put to the Conference I shall not be able to vote, and I shall abstain from voting.

The PRESIDENT. May I ask the delegate from Germany whether his remark applies to the amendment?

Baron H. VON ALVENSLEBEN, delegate of Germany. Yes, sir; to the amendment, and to the resolution also.

Professor ADAMS, delegate of England. Mr. President, I must say that I am very much inclined to agree with the delegate of Germany in the opinion that this is only a question of detail.

It is a mere matter of convenience whether we count longitudes in one direction only or in two opposite directions, considering longitudes measured in one direction as positive and in the opposite direction as negative. These two methods are nominally different from each other, but in reality there is no contradiction between them.

In the mathematical reckoning of angles we may agree to begin at zero and reckon in one direction around the entire circumference of 360 degrees, but this does not prevent a mathematician, if he finds it convenient for any purpose, from reckoning angles as positive when measured in one direction and negative when measured in the opposite direction.

If angles be considered positive when reckoned towards the east, it is quite consistent with this usage that they should be considered negative when reckoned towards the west.

It is much more convenient to consider all angles as positive in astronomical tables, but for other purposes it may be more convenient to employ negative angles also, especially when by so doing you avoid the use of large numbers.

In comparatively small countries, like Great Britain for instance, it is more convenient, when giving the longitude of a place in the west of England, to consider it as being a few degrees west of Greenwich, rather than 350 and some degrees to the east of that meridian.

Commander SAMPSON, delegate of the United States. Mr. President, while I think the question of reckoning longitude is a matter of detail, I think it devolves upon us to decide it one way or the other. Navigators are more interested in the question than mathematicians, and the longitudes must be engraved upon our hydrographic charts.

Now, as the learned delegate of Great Britain, Professor Adams, who has just spoken, has stated, the principle involved is the same, whether we reckon east or west or reckon continuously in the same direction. It seems to me, however, that when we come to consider the reckoning of longitude in connection with the adoption of a universal day, we should then make a decided choice in favor of counting longitude from zero to 360 degrees. If we adopt the resolution which my friend the delegate of the United States, Mr. Rutherfurd, has offered, it will be in perfect conformity with the habits of the world. For that reason, and it is a very strong reason, I think it might be adopted; but a little consideration will show that if we reckon the longitude from zero to 360 degrees east to west, then we will change the existing practice of reckoning longitude; but, of course, only in one hemisphere, and that will be to the eastward of the prime meridian; but, as we shall all remember, to the eastward of the prime meridian we have the main portions of the continents of Asia, Europe, and Africa, and in all the navigable water lying in the other hemisphere the longitude will continue to be reckoned as now. To navigators of the water lying to the eastward of the prime meridian there will be a change in the method of reckoning longitude. Now, if we should adopt the method of counting longitude both ways, it would be necessary to adopt two different rules for converting local into universal time.

Professor ADAMS, delegate of Great Britain. Oh, no; by no means.

Commander SAMPSON, delegate of the United States. For although one rule would answer, by having regard to the algebraical sign affecting the longitude, it must be remembered that this rule is to be applied by many who are not accustomed to distinguishing east and west longitudes by a difference of sign, and who would therefore require one rule when the longitude is east and another when it is west. If, however, we adopt the method of reckoning from zero to 360 degrees from east to west, the relation existing between the local and the universal time becomes the simplest possible. To obtain the universal date and hour, under these circumstances, it only becomes necessary to add the longitude to the local time, understanding by local time the local date as well

as the local hour. I think, for this reason, it will be preferable to reckon the longitude in one direction from east to west, instead of west to east.

Sir FREDERICK EVANS, delegate of Great Britain. I would like to present a few words on behalf of seamen. There is clearly an important change proposed by the amendment. In the resolution before us it is simply a question of the reckoning of longitude as now employed by seamen of all nations, and I think it would be well to keep that fact separate from the reckoning of time.

The PRESIDENT. The chair begs to state that the discussion is now upon the amendment of the delegate of Sweden, Count Lewenhaupt, to adopt the fourth resolution of the Congress at Rome.

Sir FREDERICK EVANS, delegate of Great Britain. Then I consider that, in the interest of seamen, it would be very undesirable to accept the amendment. We must recollect that an immense deal of the world's traffic is carried around the world entirely by sea, and that this proposed dislocation of the methods of seamen by reckoning longitude in one direction only would, to say the least, be extremely inconvenient, and it would require considerable time for them to get into the habit of doing so. I think, however, that as to the question of time, there would be no difference of opinion; doubtless it is the easier method; but, as we have to look at the practical side of this calculation of longitude, I must certainly disagree with the amendment and vote for the original resolution.

Mr. JUAN PASTORIN, delegate of Spain, then presented the following amendment:

Resolved, That the Conference proposes to the Governments here represented that longitude shall be counted from the prime meridian westward, in the direction opposite to the terrestrial rotation, and reckoned from zero degrees to 360 degrees, and from zero hours to twenty-four hours.

The PRESIDENT. The question before the Conference now is the amendment of the delegate of Sweden. If the delegate of Spain desires to offer his resolution as an amendment to the amendment already offered, the Chair will place it before the Conference.

Mr. JUAN PASTORIN, delegate of Spain. I am in accord with the views expressed by our colleague, Commander Sampson, and I propose the resolution which I have just presented.

Mr. VALERA, the delegate of Spain. I believe the amendment proposed by my colleague, Mr. Pastorin, delegate of Spain, does not apply to the amendment of the delegate of Sweden, but to the original resolution. In order to avoid all ambiguity it would be much better to discuss them one after the other. Therefore let us decide the question whether it is better to count up to 180° in each direction, or up to 360° continuously. Then we can go on to something else.

The PRESIDENT. In order to meet the views expressed by Mr. Valera, the delegate of Spain, Mr. Pastorin will withdraw his amendment, and the delegate of Sweden, Count Lewenhaupt, will propose the substance of his original resolution so modified in form that its details may be considered separately.

Mr. JUAN PASTORIN, delegate of Spain. In conformity with the statement of the president, I now withdraw my amendment.

Count LEWENHAUPT, delegate of Sweden. I beg to offer the following propositions in the form of amendments to the original resolution offered by the delegate of the United States; these may be discussed in succession:

1. That from this prime meridian (the Greenwich meridian) longitude shall be counted in one direction.

2. That such longitude shall be counted from west to east.
Or, in place of No. 2—
3. That such longitude shall be counted from east to west.

The PRESIDENT. The delegates from Sweden and Spain have agreed as to the first part of the resolution, that longitude shall be counted in one direction—that is, from zero to 360 degrees. The question before the Conference is now upon the first clause of the resolution, and the other two will be subsequently discussed.

General STRACHEY, delegate of Great Britain. I think it is impossible to proceed to a vote upon these propositions without bearing in mind what is to be decided as to the universal day. That day, as it appears to me, will have to be determined with reference to the initial meridian in such manner as to prevent, as far as possible, inconvenience from discontinuity of local time and date in passing around the world.

No matter how longitude is calculated, you must necessarily arrive at discontinuity at some point in passing around the great circle of the earth. It seems to me that the most convenient way of counting both longitude and time is that the discontinuity in both shall take place on the same point on the earth. Now, certainly, as was observed at Rome, it will be far less inconvenient if the discontinuity of date takes place on the meridian of 180° from Greenwich. Then the reckoning of local time all around the world, going from west to east in the direction of the earth's rotation, will be continuous.

In any other way, as far as I can see, there will be a discontinuity at some point on the inhabited part of the earth. If the discontinuity were to take place on the meridian of Greenwich, as has been proposed by the Conference at Rome, the dates will change there during the day-time. That, as it appears to me, will be extremely inconvenient.

In order to harmonize what I have called the discontinuity of date with the discontinuity in the reckoning of longitude, it appears to me that it will be best to reckon the longitude in both directions. There will be no discontinuity then except on the 180th meridian. It will be very inconvenient for a great part of the civilized world if the resolution which has been offered should be adopted, if, as I presume it would do, it caused discontinuity both in longitude and local time in Europe.

After all, what are we here to endeavor to do? Notwithstanding what has been said in the other direction, for my part I must say that the great object before us is to secure the greatest convenience of the whole civilized world, and it seems to me that we should try to obtain it.

If there is no very strong reason for altering the existing system of counting longitudes, it appears to me that this is a very excellent reason in favor of maintaining it. I do not see myself that, for any practical purpose, anything would be gained by reckoning longitude from zero to 360 degrees. There may be some special scientific purposes for which it may be convenient, but the object which this resolution is intended to meet is of another character.

What we want is longitude for ordinary purposes, and on that hangs the reckoning of universal time, which, of course, should be for the general use of the whole world.

Professor ADAMS, delegate of Great Britain. Mr. President, I doubt whether I should trouble the Conference in reference to this point. I think, however, that it is a matter of little importance whether we consider longitude as positive, when reckoned toward the east, and negative, when reckoned to the west, or go on in one direction from zero to 360 degrees; it amounts, mathematically speaking, to the same thing.

We never can consider mathematical lines or angles as positive in one direction, without implying that in the opposite direction they are negative. One of these is merely the complement of the other.

For myself, I would say that there is no use in the Conference resolving that we should count longitude only in the eastwardly direction. The Conference may say that if longitude is reckoned towards the east, it shall be considered positive, and if reckoned towards the west, negative; and that is all we should say. I do not think it is within the competence of the Conference to say that mathematicians shall reckon longitude only in one direction. Whether you choose to reckon right through to 360 degrees or not is a matter of detail, and of no importance in a scientific point of view. You can adopt one style or the other, according to which is found the more convenient in practice.

Mr. SANDFORD FLEMING, delegate of Great Britain. I would suggest that this matter of detail can very well be discussed and arranged by a committee, otherwise it may take up the whole time of the Conference. I move, therefore, that a committee be appointed to take up this matter and report upon it at the next meeting.

The PRESIDENT. The chair desires only to carry out the wish of the Conference, but it does not see clearly what we should gain by a committee. Still, if it be the desire of the Conference to order a committee, then the question will arise as to the organization of that committee, and the chair would feel some hesitation in appointing it.

Mr. RUTHERFURD, delegate of the United States. Mr. President, if this was a new question, in regard to which we had heard no discussion, it would be eminently proper that we should put it into the hands of a committee to formalize, and thereby to shorten our deliberations; but it seems to me that the appointment of a committee now would not help us at all. When the report of that committee came in, we should have to proceed exactly as we do now.

There are only three questions before the Conference, and they come within very narrow limits. First, shall we count longitude both ways? Second, shall we count it all around the 360 degrees? Third, if so, in which direction is the counting to take place?

These are the only three questions, and, after all, they are questions of convenience. We are just as capable of voting upon these propositions now as we should be after the appointment of a committee.

Baron VON SCHÆFFER, delegate of Austria-Hungary. Mr. President, I move that we adjourn until to-morrow at 1 o'clock p. m.

The question upon the motion to adjourn was then put and adopted, and the Conference accordingly adjourned at 3.45 p. m. until Tuesday, the 14th instant, at 1 o'clock p. m.

V.

SESSION OF OCTOBER 14, 1884.

The Conference met, pursuant to adjournment, in the diplomatic hall of the Department of State, at 1 o'clock p. m.

Present:

Austro-Hungary: Baron Ignatz von Schæffer.
Brazil: Dr. Luiz Cruls.

Chili: Mr. F. V. Gormas and Mr. A. B. Tupper.
Colombia: Commodore S. R. Franklin.
Costa Rica: Mr. Juan Francisco Echeverria.
France: Mr. A. Lefaivre, Mr. Janssen.
Germany: Baron H. von Alvensleben, Mr. Hinckeldeyn.
Great Britain: Sir F. J. O. Evans, Prof. J. C. Adams, Lieutenant-General Strachey, Mr. Sandford Fleming.
Guatemala: Mr. Miles Rock.
Hawaii: Hon. W. D. Alexander, Hon. Luther Aholo.
Italy: Count Albert de Foresta.
Japan: Professor Kikuchi.
Liberia: Mr. William Coppinger.
Mexico: Mr. Leandro Fernandez, Mr. Angel Anguiano.
Netherlands: Mr. G. de Weckherlin.
Paraguay: Capt. John Stewart.
Russia: Mr. C. de Struve, Major-General Stebnitzki, Mr. Kologrivoff.
San Domingo: Mr. de J. Galvan.
Salvador: Mr. Atonio Batres.
Spain: Mr. Juan Valera, Mr. Emilo Ruiz del Arbol, Mr. Juan Pastorin.
Sweden: Count Carl Lewenhaupt.
Switzerland: Mr. Emile Frey.
Turkey: Rustem Effendi.
United States: Rear-Admiral C. R. P. Rodgers, Mr. Lewis M. Rutherfurd, Mr. W. F. Allen, Commander W. T. Sampson, Professor Cleveland Abbe.
Venezuela: Señor Dr. A. M. Soteldo.

Absent:

Denmark: Mr. C. S. A. de Bille.

The PRESIDENT. The chair begs leave to announce that, in the regular order of business, the first matter before the Conference to-day would have been the proposition of the delegate of Great Britain, Mr. Sandford Fleming, that a committee be appointed to consider a report upon the resolution offered by him yesterday. The chair understood, however, from Mr. Fleming this morning that he had no desire to press that proposition, and, therefore, it may be considered as withdrawn.

The question then would be upon the amendment offered by the delegate of Spain, Mr. Juan Pastorin, and if that amendment be withdrawn upon the amendment offered by the delegate of Sweden, Count Lewenhaupt. The chair understands that both of those gentlemen desire to withdraw their propositions temporarily, and, in that event, the first action to be taken will be upon the resolution offered by the delegate of the United States, Mr. Rutherfurd.

Mr. RUSTEM EFFENDI, delegate of Turkey. In voting yesterday in favor of the resolutions proposed by the honorable delegate of the United States, I wish to have it well understood that my vote does not bind my Government. I am, indeed, obliged to vote against any proposition which would tend to bind it in any way, for I desire to leave it free to act in the matter.

I engage to submit to my Government the result of our deliberations and to recommend their adoption, but that is all. In other words, I have only voted *ad referendum*, and I ask that my statement be entered in the protocol.

The PRESIDENT. The chair would inform the delegate who has just spoken that the same statement was made by several delegates at a former meeting of the Conference.

M. JANSSEN, delegate of France. I believe that the very correct doctrine just enunciated by the delegate of Turkey, Mr. Rustem Effendi, is the one adopted by all the members of the Congress, and that we have all voted *ad referendum*.

The PRESIDENT. The chair so understood the general sense of the Conference as expressed at one of our former meetings, when many of the delegates made the same declaration.

Mr. ANTONIO BATRES, delegate of Salvador. Mr. President, I could not be present yesterday on account of illness, and I now request permission to register my name in favor of the resolution adopting the meridian of Greenwich as the prime meridian.

The PRESIDENT. The delegate of Salvador, Mr. Batres, informs the chair that he was not able to be present yesterday, on account of illness, and he desires that his name may be recorded as voting for the meridian of Greenwich. If there be no objection to the request of the delegate of Salvador, his vote will be so entered.

No objection being made, the president instructed the secretary to make the proper entry in the protocol.

The PRESIDENT. The delegate of Spain, Mr. Pastorin, has withdrawn his amendment, and the delegate of Sweden, Count Lewenhaupt, has also withdrawn the amendment which he offered to the resolution of the delegate of the United States, Mr. Rutherfurd. The resolution originally offered will now be read.

The secretary then read the resolution, as follows:

Resolved, That from this meridian (*i. e.* the meridian of Greenwich) longitude shall be counted in two directions up to 180 degrees, east longitude being plus, and west longitude minus.

Mr. SANDFORD FLEMING, delegate of Great Britain, representing the Dominion of Canada. I wish to offer some observations on the resolution before the Conference, but I am unable to separate the particular question from the general question. To my mind, longitude and time are so related that they are practically inseparable, and when I consider longitude my thoughts naturally revert to time, by which it is measured. I trust, therefore, I may be permitted to extend my remarks somewhat beyond the immediate scope of the resolution. I agree with those who think that longitude should be reckoned in one direction only, and I am disposed to favor a mode of notation differing in other respects from that commonly followed.

If a system of universal time be brought into use, advantages would result from having the system of time and the system of terrestrial longitude in complete harmony. The passage of time is continuous, and, therefore, I think longitude should be reckoned continuously. To convey my meaning fully, however, it is necessary that I should enter into explanations at some length.

Ten days back I ventured informally to place my views, with a series of recommendations on this subject, before the delegates. I hope I may now be permitted to submit them to the Conference.

The PRESIDENT. The chair would inquire of the Conference whether the recommendations and remarks which were sent in print to the delegates a few days ago by Mr. Sandford Fleming, the delegate of Great Britain, may be entered upon the protocol as presented to-day. Each member was, it is understood, furnished with a copy of these papers.

Mr. TUPPER, delegate of Chili. The delegates of Chili have not received them.

The PRESIDENT. The chair will take care that they are sent.

No objection was made to the request of the delegate of Great Britain, Mr. SANDFORD FLEMING, who continued as follows:

The adoption of a prime meridian common to all nations admits of the establishment of a system of reckoning time equally satisfactory to our reason and our necessities.

At present we are without such a system. The mode of notation followed by common usage from time immemorial, whatever its applicability to limited areas, when extended to a vast continent, with a net-work of lines of railway and telegraph, has led to confusion and created many difficulties. Further, it is insufficient for the purposes of scientific investigation, so marked a feature of modern inquiry.

Taking the globe as a whole, it is not now possible precisely to define when a year, or a month, or a week begins. There is no such interval of time as the commonly defined day everywhere and invariable. By our accepted definition a day is local; it is limited to a single meridian. At some points on the earth's surface one day is always at its commencement and another always ending. Thus, while the earth makes one diurnal revolution, we have continually many days in different stages of progress on our planet.

Necessarily the hours and minutes partake of this normal irregularity. Clocks the most perfect in mechanism disagree if they differ in longitude. Indeed, if clocks are set to true time, as it is now designated, they must, at least in theory, vary not only in the same State or county, but to some extent in the same city.

As we contemplate the general advance in knowledge, we cannot but feel surprised that these ambiguities and anomalies should be found, especially as they have been so long known and felt. In the early conditions of the human race, when existence was free from the complications which civilization has led to; in the days when tribes followed pastoral pursuits, and each community was isolated from the other; when commerce was confined to few cities, and intercommunication between distant countries rare and dificult; in those days there was no requirement for a common system of uniform time. No inconvenience was felt in each locality having its own separate and distinct reckoning. But the conditions under which we live are no longer the same. The application of science to the means of locomotion and to the instantaneous transmission of thought and speech have gradually contracted space and annihilated distance. The whole world is drawn into immediate neighborhood and near relationship, and we have now become sensible to inconveniences and to many disturbing influences in our reckoning of time utterly unknown and even unthought-of a few generations back. It is also quite manifest that, as civilization advances, such evils must greatly increase rather than be lessened, and that the true remedy lies in changing our traditional usages in respect to the notation of days and hours, whatever shock it may give to old customs and the prejudices engendered by them.

In countries of limited extent the difficulty is easily grappled with. By general understanding, an arrangement affecting the particular community may be observed, and the false principles which have led to the differences and disagreements can be set aside. In Great Britain the time of the observatory at Greenwich is adopted for general use. But this involves a departure from the principles by which time is locally determined, and hence, if these principles be not wrong, every clock in the United Kingdom, except those on a line due north and south from Greenwich, must of necessity be in error.

On the continent of North America efforts have recently been made to adjust the difficulty. The steps taken have been in a high degree

successful in providing a remedy for the disturbing influences referred to, and, at the same time, they are in harmony with principles the soundness of which is indisputable.

When we examine into time in the abstract, the conviction is forced upon us that it bears no resemblance to any sort of matter which comes before our senses; it is immaterial, without form, without substance, without spiritual essence. It is neither solid, liquid, nor gaseous. Yet it is capable of measurement with the closest precision. Nevertheless, it may be doubted if anything measurable could be computed on principles more erroneous than those which now prevail with regard to it.

What course do we follow in reckoning time? Our system implies that there are innumerable conceptions designated "time." We speak of solar, astronomical, nautical, and civil time, of apparent and mean time. Moreover, we assign to every individual point around the surface of the earth separate and distinct times in equal variety. The usages inherited by us imply that there is an infinite number of times. Is not all this inconsistent with reason, and at variance with the cardinal truth, that there is one time only?

Time may be compared to a great stream forever flowing onward. To us, nature, in its widest amplitude, is a unity. We have but one earth, but one universe, whatever its myriad component parts. That there is also but one flow of time is consistent with the plain dictates of our understanding. That there can be more than one passage of time is inconceivable.

From every consideration, it is evident that the day has arrived when our method of time-reckoning should be reformed. The conditions of modern civilization demand that a comprehensive system should be established, embodying the principle that time is one abstract conception, and that all definite portions of it should be based on, or be related to, one unit measure.

On these grounds I feel justified in respectfully asking the consideration of the Conference to the series of recommendations which I venture to submit.

The matter is undoubtedly one in which every civilized nation is interested. Indeed, it may be said that, more or less, every human being is concerned in it. The problem is of universal importance, and its solution can alone be found in the general adoption of a system grounded on principles recognized as incontrovertible.

Such principles are embodied in the recommendations which I am permitted to place before the Conference. They involve, as an essential requirement, the determination of a unit of measurement, and it is obvious that such a unit must have its origin in the motion of the heavenly bodies. No motion is more uniform than the motion of the earth on its axis. This diurnal revolution admits of the most delicate measurement, and, in all respects, is the most available for a unit measure. It furnishes a division of time definite and precise, and one which, without difficulty, can be made plain and manifest.

A revolution of the earth, denoted by the mean solar passage of the prime or anti-prime meridian, will be recognizable by the whole world as a period of time common to all. By general agreement this period may be regarded as the common unit by which time may be everywhere measured for every purpose in science, in commerce, and in every-day life.

The scheme set forth in the recommendations has in view three principal objects, viz:

1. To define and establish a universal day for securing chronological accuracy in dates common to the whole world.

2. To obtain a system of universal time on a basis acceptable to all nations, by which, everywhere, at the same time, the same instant may be observed.

3. To establish a sound and rational system of reckoning time, which may eventually be adopted for civil purposes everywhere, and thus secure uniformity and accuracy throughout the globe.

But, in the inauguration of a scheme affecting so many individuals, it is desirable not to interfere with prevailing customs more than necessary. Such influences as arise from habit are powerful, and cannot be ignored. The fact must be recognized that it will be difficult to change immediately the usages to which the mass of men have been accustomed. In daily life we are in the habit of eating, sleeping, and following the routine of our existence at certain periods of the day. We are familiar with the numbers of the hours by which these periods are known, and, doubtless, there will be many who will see little reason in any attempt to alter their nomenclature, especially those who take little note of cause and effect, and who with difficulty understand the necessity of a remedy to some marked irregularity which, however generally objectionable, does not bear heavily upon them individually.

For the present, therefore, we must adapt a new system, as best we are able, to the habits of men and women as we find them. Provision for such adaptation is made in the recommendations by which, while local reckoning would be based on the principles laid down, the hours and their numbers need not appreciably vary from those with which we are familiar. Thus, time-reckoning in all ordinary affairs in every locality may be made to harmonize with the general system.

Standard time throughout the United States and Canada has been established in accord with this principle. Its adoption has proved the advantages which may be attained generally by the same means. On all sides these advantages have been widely appreciated, and no change intimately bearing upon common life was ever so unanimously accepted. Certainly, it is an important step towards the establishment of one system of universal time, or, as it is designated in the recommendations, cosmic time.

The alacrity and unanimity with which the change has been accepted in North America encourages the belief that the introduction of cosmic time in every-day life is not unattainable. The intelligence of the people will not fail to discover, before long, that the adoption of correct principles of time-reckoning will in no way change or seriously affect the habits they have been accustomed to. It will certainly sweep away nothing valuable to them. The sun will rise and set to regulate their social affairs. All classes will soon learn to understand the hour of noon, whatever the number on the dial, whether six, as in Scriptural times, or twelve, or eighteen, or any other number. People will get up and retire to bed, begin and end work, take breakfast and dinner at the same periods of the day as at present, and our social habits and customs will remain without a change, depending, as now, on the daily returning phenomena of light and darkness.

The one alteration will be in the notation of the hours, so as to secure uniformity in every longitude. It is to be expected that this change will at first create some bewilderment, and that it will be somewhat difficult to be understood by the masses. The causes for such a change to many will appear insufficient or fanciful. In a few years, however, this feeling must pass away, and the advantages to be gained will become so manifest that I do not doubt so desirable a reform will eventually commend itself to general favor and be adopted in all the affairs of life.

Be that as it may, it seems to me highly important that a comprehensive time system should be initiated to facilitate scientific observations and definitely to establish chronological dates; that it should be designated for general use in connection with railways and telegraphs and for such other purposes for which it may be found convenient.

The cosmic day set forth in the recommendations would be the date for the world recognizable by all nations. It would theoretically and practically be the mean of all local days, and the common standard to which all local reckoning would be referable.

With regard to the reckoning of longitude, I submit that longitude and time are so intimately related that they may be expressed by a common notation. Longitude is simply the angle formed by two planes passing through the earth's axis, while time is the period occupied by the earth in rotating through that angle. If we adopt the system of measuring time by the revolution of the earth from a recognized zero, one of these planes—that through the zero—may be considered fixed; the other—that through the meridian of the place—being movable, the longitudinal angle is variable. Obviously the variable angle ought to be measured from the fixed plane as zero, and as the motion of the earth by which the equivalent time of the angle is measured is continuous, the longitude ought to be reckoned continuously in one direction. The direction is determined by the notation of the hour meridians, viz, from east to west.

If longitude be so reckoned and denoted by the terms used in the notation of cosmic time, the time of day everywhere throughout the globe would invariably denote the precise longitude of the place directly under the mean sun. Conversely, at the epoch of mean solar passage at any place, the longitude being known, cosmic time would be one and the same with the longitude of the place.

The advantages of such a system of reckoning and nomenclature, as suggested in the recommendations which I now submit, will be, I think, self-evident.

RECOMMENDATIONS FOR THE REGULATION OF TIME AND THE RECKONING OF LONGITUDE.

1. That a system of universal time be established, with the view of facilitating synchronous scientific observations, for chronological reckonings, for the purpose of trade and commerce by sea and land, and for all such uses to which it is applicable.

2. That the system be established for the common observance of all peoples, and of such a character that it may be adopted by each separate community, as may be found expedient.

3. That the system be based on the principle that for all terrestrial time reckonings there be one recognized unit of measurement only, and that all measured intervals of time be directly related to the one unit measure.

4. That the unit measure be the period occupied by the diurnal revolution of the earth, defined by the mean solar passage at the meridian twelve hours from the prime meridian established through Greenwich.

5. That the unit measure defined as above be held to be a day absolute, and designated a cosmic day.

6. That such cosmic day be held as the chronological date of the earth, changing with the mean solar passage at the anti meridian of Greenwich.

7. That all divisions and multiples of the cosmic day be known as cosmic time.

8. That the cosmic day be divided into hours, numbered in a single series, one to twenty-four (1 to 24), and that the hours be subdivided, as ordinary hours, into minutes and seconds. NOTE.—As an alternative means of distinguishing the cosmic hours from the hours in local reckonings, they may be denoted by the letters of the alphabet, which, omitting I and V, are twenty-four in number.

9. That until cosmic time be admitted as the recognized means of reckoning in the ordinary affairs of life, it is advisable to assimilate the system to present usages and to provide for the easy translation of local reckonings into cosmic time, and *vice versa;*

that, therefore, in theory, and as closely as possible in practice, local reckonings be based on a known interval in advance or behind cosmic time.

10. That the surface of the globe be divided by twenty-four equidistant hour meridians, corresponding with the hours of the cosmic day.

11. That, as far as practicable, the several hour meridians be taken according to the longitude of the locality, to regulate local reckonings, in a manner similar to the system in use throughout North America.

12. That, in all cases where an hour meridian is adopted as the standard for regulating local reckonings, in a particular section or district, the civil day shall be held to commence twelve hours before and end twelve hours after the mean solar passage of such hour meridian.

13. That the civil day, based on the prime meridian of Greenwich, shall coincide and be one with the cosmic day. That civil days on meridians east of Greenwich shall be (according to the longitude) a known number of hours, or hours and minutes in advance of cosmic time, and to the west of Greenwich the contrary.

14. That the surface of the globe being divided by twenty-four equidistant meridians (fifteen degrees apart) corresponding with the hours of the cosmic day, it is advisable that longitude be reckoned according to these hour meridians.

15. That divisions of longitude less than an hour (fifteen degrees) be reckoned in minutes and seconds and parts of seconds.

16. That longitude be reckoned continuously towards the west, beginning with zero at the anti-prime meridian, twelve hours from Greenwich.

17. That longitude, generally, be denoted by the same terms as those applied to cosmic time.

I submit these recommendations suggestively and without any desire unduly to press them. I shall be content if the leading principles laid down be recognzied by the Conference.

With regard to the more immediate question, I have come to the firm conviction that extreme simplicity of reckoning and corresponding benefits would result if longitude be notated in the same manner, and denoted by the same terms as universal time. If, therefore, the Conference adopts the motion of the distinguished delegate of the United States, which, I apprehend, is designed to cause as little change as possible in the practices of sea-faring men, I trust the claims of other important interests will not be overlooked. I refer to all those interests so deeply concerned in securing accurate time on land, and in having easy means provided for translating any one local reckoning into any other local reckoning, or into the standard universal time. In this view I trust the Conference will give some expression of opinion in favor of extending around the globe the system of hour meridians which has proved so advantageous in North America. In an educational aspect alone it seems to me important that the hour meridians, one to twenty-four, numbered from the anti-prime meridian continuously towards the west, should be conspicuously marked on our maps and charts.

Professor ADAMS, delegate of Great Britain. I wish, Mr. President, to express my entire adhesion to the proposition which has been made by the delegate of the United States, Mr. Rutherfurd. It seems to me to satisfy one of the principal conditions that we have had before us to guide our decision; that is, that we should pursue a course which will produce the least possible inconvenience.

Now, I think if we keep that in mind, we shall have very little difficulty in coming to the conclusion that we should reckon longitude eastward as positive or plus, and westward as negative or minus. This mode of reckoning would be attended with the least inconvenience; in fact, it will not be attended with any inconvenience at all, because it will keep to the present mode of reckoning. For my part, I see no adequate reason for changing that. There is no scientific reason, and certainly there is no practical reason. There is no scientific reason, because, as I stated yesterday, if in mathematics you measure from the

zero a distance in one direction and consider that positive, you must, by the very nature of the case, consider the distance measured in the opposite direction from the same zero as negative. One follows mathematically and necessarily from the other, and by adopting this resolution you thus include both in one general formula.

It seems to me quite as scientific, to say the least, to start from zero and go in both directions, distinguishing the longitudes by the signs plus and minus, according as the directions are taken east or west, as to reckon longitudes in one direction only from zero to 360 degrees. It is, I say, just as scientific to do this, and practically it is more convenient. Because if you go on reckoning from zero to 360 degrees continuously, you have to make a break at 360 degrees. You do not count on after you have completed one revolution, but have to drop the 360 degrees and start again at zero. But this is attended with great inconvenience, because this break in counting occurs in countries which are thickly inhabited. The longitude would be a little less than 360 degrees on one side of the prime meridian, and on the other side the longitude would be a small angle. This seems to me very inconvenient.

On the other hand, if you count longitudes in one direction from zero to 180 degrees as positive, and in the opposite direction from zero to 180 degrees as negative, you are, no doubt, obliged to make a break in passing abruptly from plus 180 degrees to minus 180 degrees. But the break would then occur where it would cause the least inconvenience, viz, in mid-ocean, where there is very little land and very few inhabitants, and where we are accustomed to make the break now. This will require no change in the habits and customs of the people, and no inconvenience whatever would be caused by the action of the Conference if it decides on this method, which also has the minor advantage of not requiring the use of such large numbers as the other. But to adopt the reckoning of longitude from zero to 360 degrees would involve a very considerable change, and I think it may be doubted whether it would be generally accepted. Under the circumstances, I think the resolution contains the most expedient course for us to adopt. I do not object to anybody who chooses to do so reckoning on, for certain purposes, from zero to 360 degrees, but I do not think it would be well to make it compulsory.

With regard to the proposal of the delegate of Great Britain, Mr. Fleming, I would say that it would be attended with great inconvenience, because it departs from the usages and habits now existing. That, to my mind, is a very great and insuperable objection, and I do not see any countervailing advantage.

With regard to the subject of time that Mr. Fleming is anxious to take into consideration, I think that nothing can be simpler, if I may be allowed to deal with the question of time, than the relation between time and longitude which is proposed to be created by the resolution of Mr. Rutherfurd.

By that resolution the longitude indicates the relation between the local time and the universal time in the simplest possible way. What can be easier than the method involved in the resolution of Mr. Rutherfurd? It is this: Local time at any place is equal to universal time plus the longitude of the place, plus being understood always in a mathematical sense. The longitude is to be added to the universal time if it is positive and subtracted if it is negative. That is very simple, the whole being involved in one general formula.

Now, I think it is perfectly impossible for Mr. Fleming to make a more simple formula than that. The formula laid down in the pro-

ceedings of the Roman Conference was far less simple,as it involved an odd twelve hours. You got the universal time equal to the local time, minus the longitude, plus twelve hours. This is far from simple. It makes the calculation more complicated, and it seems to me that for other reasons it is objectionable.

Mr. RUTHERFURD, delegate of the United States. Mr. President, I do not propose to take up the time of the Conference in reiterating the very conclusive remarks in favor of this resolution made by the delegate of Great Britain. I wish, however, to allude for a moment to another view of this question. Suppose we do not adopt this resolution. What is the course before the Conference? We shall be called upon, no doubt, to decide that longitude shall be counted all around the world from zero to 360 degrees.

That general proposition is one which would not probably meet with violent opposition, but the next point is one that will divide us very materially, and perhaps disastrously. Which way shall we count? Shall it be towards the east or towards the west?

My conversations with the gentlemen here present have led me to know that there is a very great difference of opinion upon this point, and I believe that if we should not adopt this resolution and should decide to count longitude from zero to 360 degrees, a preference to count it in one direction rather than the other would be established only by a very close vote, nearly annulling the whole moral influence of the Conference, and we should go back to our Governments without much, if any, authority on the point in question.

And I doubt whether our resolutions would be accepted by these Governments if we show ourselves to be divided upon a question of so much practical importance.

It is simply a question of practice—of convenience. We all bowed to the rule of convenience in selecting the meridian of Greenwich. And why? Because seven-tenths of the civilized nations of the world use this meridian, not that it was intrinsically better than the meridian of Paris, or Washington, or Berlin, or St. Petersburg. Nobody claimed any scientific preference among these meridians. It was simply because seven-tenths of the civilized world were already using the meridian of Greenwich.

If we accept this argument in favor of the first resolution for selecting the initial meridian, why should we not be equally inclined to recognize the fact that all the civilized world count longitude in both ways? There is no difference of opinion on that point. There is no difference of usage. Shall we break that usage? Shall we introduce a new system, which may or may not be found practical or agreeable? Shall we not rather adopt the rule of all nations already in use among their practiced astronomers and navigators by saying, "Continue to do as you have already done"?

Sir FREDERICK EVANS, delegate of Great Britain. Having for many years mixed among the practical seamen of more than one nation, I confess I look with some dismay on any other system for the notation of longitude being adopted than the one proposed in this resolution.

My colleague, Mr. Fleming, made the remark that he could not disassociate longitude from time. If he had mixed with seamen he would have found out that there is very frequently a well-defined difference between the two in their minds. Longitude with seamen means, independently of time, space, distance. It indicates so many miles run in an east or west direction. Consequently, I am not able to look upon longitude and time as being identical.

Under these circumstances, this resolution also, as I understand it, should be considered on practical grounds.

The question of universal time will come on for consideration hereafter, and how that may be settled seems to me a matter of indifference compared with the decision on this resolution. I question, for myself, whether any other plan than that it proposes would be generally accepted. That is what I am afraid of. Whatever respect nations may have for this Conference, public opinion would be very strong upon the point now at issue. When you further recollect that all around the globe, in all these various seas, there are colonies with histories; that their geographical positions and boundaries were originally recorded by longitude according to the notation of which I have spoken, I think it is to be oversanguine to expect that these colonies will accept a new notation of longitude without greater proof of the positive necessity of the change. It would not be the fiat of this Conference, or the fiat of any Government, that would bring about the change. I say this with all deference to the opinions of those who have advocated a change.

General STRACHEY, delegate of Great Britain. At the risk of repeating somewhat my remarks made to the Congress when we last met, I would add a few words to what has now been said. It is our wish that the points of real difference should, as far as possible, be clearly brought out before the Conference comes to a vote.

As regards the counting of longitude in two directions, and the degree of advantage or disadvantage that may arise in starting from zero and treating east longitude as positive or plus, and west longitude as negative or minus, let me ask the attention of the Congress to the fact that longitude is already counted in these two directions, and that, as a matter of fact also, latitude is counted in the same way, in both directions from the equator, north latitude being plus and south latitude minus. Nobody, so far as I have heard, has ever proposed that we should abolish this method of reckoning latitude, and substitute for it north or south polar distance, to be counted right around the earth; and yet there is the same quasi-scientific objection to the present method of counting in the one case as in the other. As already stated, it seems to me that, for the purposes of practical convenience, it is extremely difficult, if not impossible, to separate the ideas on which the reckoning of longitude must be based from those which must regulate the reckoning of time, and especially the reckoning of time in the sense of adopting a universal day over the whole world. Now, it appears to me that, as regards the acceptance of the universal day, it certainly will be anything but convenient if it begins and ends otherwise than when the sun passes the 180th meridian. On the contrary, I think it will be extremely inconvenient. I think that if the world were to adopt the meridian of Greenwich as the origin of longitude, the natural thing for it to do would be to have the international day, the universal day, begin from the 180th meridian from Greenwich—that is, to coincide with the Greenwich civil day. That meridian passes, as I said before, outside of New Zealand, and outside of the Fiji Islands; it goes over only very small portion of inhabited country. It appears to me, therefore, that inasmuch as there must be an absolute break or discontinuity in time in passing round the earth—a break of twenty-four hours—it is much more convenient that this break should take place in the uninhabited part of the earth than in the very center of civilization.

If we adopt the universal day which coincides with the civil day at Greenwich, then you will be able to have complete continuity of local time over the whole earth, in harmonious relation with the universal

day, except at the break which necessarily takes place on the 180th meridian. Otherwise this will not be possible. For instance, according to the system proposed by the resolution, the local time corresponding, say, to 0 hours of Monday at Greenwich, would, in passing round the earth to the eastward from the 180th meridian, gradually change from 12 hours of Sunday to 12 hours of Monday; and, on returning to that meridian, the break of time would occur, and one day would appear to be lost. But complete continuity both in days and hours, and harmony with the universal day, that is, the Greenwich civil day, would be preserved for the whole earth, excepting on crossing the 180th meridian.

The result of the system which was proposed at Rome would be to cause the break of dates to take place at Greenwich at noon, so that the morning hours of the civil day would have a different universal date from the afternoon hours, and this would be the case all over Europe. But if the universal day be made to correspond to the civil day of Greenwich, and the longitude is counted east in one direction and west in another direction to the 180th meridian, these difficulties would be overcome, and a perfectly simple rule would suffice for converting local into universal time. As regards what was said upon the subject of longitude being plus or minus, according as you move to the east or west, it appears to me that there is a positive, clear, and rational reason for calling longitude eastward plus and longitude westward minus. The time is later to the east, and therefore the hour is indicated by a higher number. In converting universal into local time, if the place is east of Greenwich, you add the longitude to the universal time, and therefore increase the number of the hour; if the place be west of Greenwich, you subtract the longitude, and therefore diminish the number of the hour. It is natural, therefore, to call east longitude positive and the other negative.

It appears to me also that the passage of the sun over the meridian is, in reality, what may be called the index of the day, the day consisting of twenty-four hours, distributed equally on either side of the meridian. Noon of the universal day, would thus coincide with the time of the sun passing the initial meridian. There is perfect consistency, therefore, in adopting the reckoning of longitude and time that is proposed in the resolution before us. It is a rational and symmetrical method.

Mr. JUAN PASTORIN, the delegate of Spain. I listened with great pleasure to the observations which our honorable colleague, the delegate of England, General Strachey, has just made.

I am not sufficiently acquainted with the English tongue to make a speech, though I know it well enough to follow the debate. Moreover, as I had beforehand studied the subject which is now before us, I have quite well understood all that has been said on this point. I proposed an amendment yesterday, in order to obtain what I consider the most simple formula for converting local time into cosmical time. This formula is not, perhaps, the most suitable for astronomers and sailors, but they form the minority, and it is, I am sure, the easiest for the mass of the people. The formula would be based on the considerations which are now under discussion. I am not sufficiently familiar with the language to give the reasons upon which I based my amendment, but, as I demonstrated in the pamphlet which I had the honor of addressing to my learned colleagues, the means, in my opinion, of obtaining the simplest and the most suitable formula is to make the beginning of civil time and of dates on the first meridian coincide with the cosmical time and date,

and to count longitude continuously in the same direction from the initial meridian. This is what I proposed to obtain by my amendment.

Count LEWENHAUPT, delegate of Sweden. Mr. President, I now propose that the Conference take a recess for a few moments before a vote is taken upon the resolution.

No objection being made to the motion, the President announced that a recess would be taken until the Chair called the Conference to order.

The PRESIDENT, having called the Conference to order, said: The recess has given an opportunity for an interchange of opinion upon the subject pending, and if the Conference be ready the vote will now be taken.

Commander SAMPSON, delegate of the United States. Mr. President, I think that the informal discussion which we have had upon this question of the method of counting longitude must lead to the conclusion that there is a great difference of opinion. So far as I have been able to learn, many of the delegates have come here instructed to favor the resolution adopted by the Roman Conference. It is my own opinion that the recommendation to count longitude continuously from the prime meridian from west to east, as recommended by the Conference at Rome, is not so good as the proposition now before us. Personally, however, I would prefer to see it counted continuously from east to west, as being more in conformity with present usage among astronomers. But, as it appears that so many delegates are instructed by their Governments to favor counting in the opposite direction, and as, if this Congress adopts any other plan than that proposed by the Conference at Rome, they will have to lay before their Governments, as the action of this Congress, something that will be opposed to the recommendation of the Roman Conference, and as these two recommendations would naturally tend to neutralize each other, I would favor the proposition which is now before us as being the most expedient.

I would suggest, however, that instead of making a positive declaration upon the question we leave it as it now stands; that is to say, that longitude shall be counted east and west from the prime meridian, without specifying which direction shall be considered positive, and declare it to be the opinion of this Congress that it is not expedient to change the present method of counting longitude both ways from the prime meridian.

Count LEWENHAUPT, delegate from Sweden. In my opinion the delegates have not undertaken to recommend the resolutions adopted by a majority of the Conference, but only the resolutions for which they have themselves voted. As regards the fact that there may be great differences of opinion concerning the questions which remain for our consideration, I am unable to see in it any reason for our not proceeding to vote upon them. On the contrary it will be of great interest to our Governments to know the exact position taken by each of the delegates, and even if any delegate should abstain from voting, such abstention would be of interest in the event of future negotiations on the subject. I am therefore of opinion that we should proceed to vote on the remaining resolutions.

The vote was then taken upon the resolution of the delegate of the United States, Mr. Rutherfurd, which is as follows:

Resolved, That from this meridian (*id est*, Greenwich) longitude shall be counted in two directions up to 180 degrees, east longitude being plus and west longitude minus.

The following states voted in the affirmative: Chili, Colombia, Costa Rica, Great Britain, Guatemala, Hawaii, Japan, Liberia, Mexico, Paraguay, Russia, Salvador, United States, Venezuela.

The following states voted in the negative: Italy, Netherlands, Spain, Sweden, Switzerland.

The following states abstained from voting: Austria-Hungary, Brazil, France, Germany, San Domingo, Turkey.

Ayes, 14; noes, 5; abstaining, 6.

The PRESIDENT then announced that the resolution was adopted.

Mr. RUTHERFURD, delegate of the United States. Mr. President, I now propose to read the third resolution from the printed circular which has been furnished to the delegates. It is as follows:

Resolved, That the Conference proposes the adoption of a universal day for all purposes for which it may be found convenient, and which shall not interfere with the use of local time where desirable. This universal day is to be a mean solar day; is to begin for all the world at the moment of midnight of the initial meridian coinciding with the beginning of the civil day and date of that meridian, and is to be counted from zero up to twenty-four hours.

This resolution is somewhat complex, and in order to facilitate debate I propose that we first occupy ourselves only with the first clause, namely:

Resolved, That the Conference proposes the adoption of a universal day for all purposes for which it may be found convenient, and which shall not interfere with the use of local time where desirable.

After having disposed of that clause we can proceed to dispose of the other parts of the resolution.

The PRESIDENT. You propose, then, to divide the resolution as printed in the circular into two resolutions, and you now offer the first part for consideration.

Mr. RUTHERFURD, delegate of the United States. If that is the more convenient form of putting it, it meets my views. It will be more easy to discuss the subject, more easy to arrive at a decision in that form.

M. le Comte ALBERT DE FORESTA, delegate of Italy. I propose as an amendment the fifth resolution of the Roman Conference, which reads as follows:

The Conference recognizes, for certain scientific needs and for the internal service of great administrations of ways of communications, such as those of railroads, lines of steamships, telegraphic and postal lines, the utility of adopting a universal time, in connection with local or national times, which will necessarily continue to be employed in civil life.

The PRESIDENT. The question is now upon the amendment offered by the delegate of Italy.

Professor ABBE, delegate of the United States. I would like to ask whether this amendment adds anything substantially to the resolution. I think it does not. It simply specifies the details of the resolution pending before us. That resolution "proposes the adoption of a universal day for all purposes for which it may be found convenient." That is general. The amendment merely specifies certain of these purposes. That is a matter of detail.

Mr. ALLEN, delegate of the United States. Mr. President, I desire to offer an amendment to the amendment, as follows:

Civil or local time is to be understood as the mean time of the approximately central meridian of a section of the earth's surface in which a single standard of time may be conveniently used.

Mr. RUTHERFURD, delegate of the United States. Mr. President, it does not seem to me that it is within the competence of this Conference to define what is local time. That is a thing beyond us.

Mr. W. F. ALLEN, delegate of the United States, then said: Mr. President and gentlemen, all efforts to arrive at uniformity in scientific or every-day usage originate in a desire to attain greater convenience in practice. The multiplicity of coins of which the relative value can only be expressed by fractions, the various common standards of weights and of measures, are inconvenient both to the business man and the scientist. Alike inconvenient to both are the diverse standards of time by which the cities of the world are governed, differing, as they do, by all possible fractions of hours.

All coins have a relative and interchangeable value based upon their weight and fineness. Weights and measures remain the same by whatever unit they may be expressed; but, primarily, time can only be measured by a standard actually or apparently in motion. Absolutely accurate mean local time, varying, as it does, by infinitesimal differences at every point in the circuit of the earth, may be shown on a stationary object, but cannot in general be kept by an individual or object in motion. The mean local time of some fixed point in each locality must be taken as the standard for practical use. The important question to be determined is, over what extent of territory, measuring east and west from such fixed point, its mean time may be employed for all ordinary purposes without inconvenience. This can be absolutely determined only by practical experience.

Careful study of this phase of this subject led, perhaps, more directly than any one single cause, to the proposal of the detailed system of standard time which now satisfactorily controls the operations of one hundred and twenty thousand miles of railway in the United States and Canada, and governs the movements of fifty millions of people.

Before the recent change there were a number of localities where standards of time were exclusively employed, which varied as much as thirty minutes, both on the east and the west, from mean local time, without appreciable inconvenience to those using them. From this fact the conclusion was inevitable that within those limits a single standard might be employed. The result has proved this conclusion to have been well founded.

No public reform can be accomplished unless the evil to be remedied can be made plainly apparent. That an improvement will be effected must be clearly demonstrated, or the new status of affairs which will exist after the change must be shown to have been already successfully tried. Here, as in law, custom and precedent are all-powerful. It would be a difficult task to secure the general adoption of any system of time-reckoning which cannot be employed by all classes of the community. Business men would refuse to regard as a reform any proposition which introduced diversity where uniformity now exists, nor would railway managers consent to adopt for their own use a standard of time not coinciding with or bearing a ready relation to the standard employed in other business circles. To adopt the time of a universal day for all transportation purposes throughout the world, and to use it collaterally with local time, would simply restore, and possibly still more complicate, the very condition of things in this country which the movement of last year was intended, to and did to a great extent, obviate. Railway managers desire that the time used in their service shall be either precisely the same as that used by the public, or shall differ from it at as few points as possible, and then by the most readily calculated differences. The public, on the other hand, have little use for absolutely accurate time, except in connection with matters of transportation, but will refuse to adopt a standard which would materially alter

their accustomed habits of thought and of language in every-day life. That this position is absurd may be argued, and perhaps admitted, but it is a fact, and one which cannot be disregarded.

The adoption of the universal day or any system of time-reckoning based upon infrequent—such as the great quadrant—meridians, to be used by transportation lines collaterally with local time, is, therefore, practically impossible.

Shall it, then, be concluded that there is no hope of securing uniformity in time-reckoning for practical purposes? Or does the proposition for the general division of the earth's surface into specified sections, governed by standards based upon meridians fifteen degrees or one hour apart, supply the remedy? Objections have been urged against this proposition on account of difficulties encountered, or supposed to be encountered, in the vicinity of the boundary lines between the sections. It is argued that the contact of two sections with standards of time differing by one hour will cause numerous and insuperable difficulties. In railway business, in which time is more largely referred to than in any other, the experience of the past year has proved this fear to be groundless. It is true that the approximate local time of a number of cities near the boundary lines between the eastern and central sections in the United States is still retained. A curious chapter of incidents could be related which led to this retention, not affecting, however, the merits of the case; but the fact serves to show that changes much greater than thirty minutes from local time would not be acceptable.

Adjacent to and on either side of all national boundary lines the inhabitants become accustomed to the standards of weights, measures, and money of both countries, and constantly refer to and use them without material inconvenience. In the readjustment of a boundary upon new lines of demarkation it must be expected that some temporary difficulties in business transactions will be encountered, but al lhistory shows that such difficulties soon adjust themselves. Legal enactments will finally determine the precise boundaries of the several sections. If different laws respecting many other affairs of life may exist on either side of a State or national boundary line with positive advantage or without material inconvenience, why should laws respecting time-reckoning be an exception? Coins and measures are distinguished by their names. So, also, may standards of time be distinguished.

The adoption of standard time for all purposes of daily life based upon meridians fifteen degrees apart would practically abolish the use of exact local time, except upon those meridians. Numerous circumstances might be related demonstrating how very inaccurate and undetermined was the local time used in many cities in this country before the recent change.

Except for certain philosophical purposes, does the inherent advantage claimed in the use of even approximately accurate local time really exist? Would the proposed change affect any custom of undoubted value to the community? These questions have been answered in the negative by the experience of Great Britain since January 13, 1848, of Sweden since January 1, 1879, and of the United States and Canada since November 18, 1883.

Greenwich time is exclusively used in Great Britain, and differs from mean local time about eight minutes on the east and about twenty-two and a half minutes on the west. In Sweden the time of the fifteenth degree of east longitude is the standard for all purposes. It differs from mean local time about thirty-six and a half minutes on the east and

about sixteen minutes on the west. In the United States the standards recently adopted are used exclusively in cities like Portland, Me. (33,800 inhabitants), and Atlanta, Ga. (37,400 inhabitants), of which the local times are, respectively, nineteen minutes and twenty-two minutes faster than the standard, and at Omaha, Nebr. (30,500 inhabitants), and Houston, Tex. (16,500 inhabitants), each twenty-four minutes slower. At Ellsworth, Me., a city of 6,000 inhabitants, a change of twenty-six minutes has been made. Nearly 85 per cent. of the total number of cities in the United States of over 10,000 inhabitants have adopted the new standard time for all purposes, and it is used upon 97½ per cent. of all the miles of railway lines.

Let us now consider whether insuperable practical difficulties owing to geographical peculiarities will prevent the adoption of this system throughout the world.

A table has been prepared, and accompanies this paper, upon which are designated the several governing meridians and names suggested for the corresponding sectional times. For the use of this table I am indebted to Mr. E. B. Elliott, of this city.

On the North American continent, in the United States and Canada, the 75th, 90th, 105th, and 120th west Greenwich meridians now govern time. In Mexico the 105th west meridian is approximately central, except for Yucatan, which is traversed by the 90th. For Guatemala, Salvador, and Costa Rica, the 90th west meridian is approximately central. San Domingo closely approaches and Cuba touches the 75th.

In South America, the United States of Colombia, Ecuador, Peru, the western portion of Bolivia, and Chili would use the time of the 75th west meridian, while Venezuela, Guiana, Western Brazil, including the Amazon River region, Eastern Bolivia, Paraguay, Uruguay, and the Argentine Republic would be governed by the time of the 60th meridian. In Eastern Brazil the 45th west meridian would govern.

Passing to Europe, we find Great Britain already governed by the zero meridian time, which can also be used in the Netherlands, Belgium, France, Spain, and Portugal. The 15th east meridian, which is about as far east of Berlin as west of Vienna, and no more distant from Rome than from Stockholm, now governs all time in Sweden. This time could also be advantageously used in Denmark, Germany Austria-Hungary, Switzerland, Italy, and Servia. The time of the 30th east meridian, which is nearly the mean between Constantinople and St. Petersburg times, could be used in Western Russia, Turkey, Roumania, Bulgaria, East Roumalia, and Greece. When the development of Eastern Russia in Europe shall require it, the division of that great country between the times of the 30th and 45th east meridians, upon lines of convenience similar to those employed in the United States, can doubtless be arranged.

The governing meridians for Africa appear to present some advantages, especially for Egypt, and no insuperable difficulties; but for continents where the boundaries of countries are so loosely defined, the limits of time-reckoning cannot well and need not now be shown. They would ultimately adjust themselves.

In Asia, the 60th east meridian passes through Khiva. Bombay would use the 75th and Calcutta the 90th. The 105th east meridian touches Siam, the 120th is near Shanghai, and the 135th passes through Japan and near Corea. The 150th meridian of west longitude is sufficiently near Hawaii.

In Australia, the 150th, 135th, and 120th meridians of east longitude

are admirably located for governing, respectively, the time of the eastern, central, and western divisions of that continent.

In none of the localities defined or mentioned would the standards proposed vary more from mean local time than has already been demonstrated to be practicable without detriment to any material interest. Convenience of use, based largely upon the direction of greater commercial intercourse, would determine the action of communities other than those mentioned, and probably somewhat modify the schedule proposed.

That no practical difficulty of usage would prevent the universal adoption of the hour-section system of time-reckoning is apparent. Its convenience has been abundantly realized. In adopting it practically no expense whatever is incurred. The alteration of the works or faces of watches or clocks is not required. Their hands are simply set to the new standard, and the desired result is accomplished.

By the adoption of this system the exact hours of time-reckoning, although called by different names in the several sections for every-day life, but specifically designated, if desired, for scientific purposes, would be indicated at the same moment of time at all points. The minutes and seconds would everywhere agree. The absolute time of the occurrence of any event could, therefore, be readily determined. The counting of the hour meridians should begin where the day begins at the transition line.

It would then be one of the possibilities of the powers of electricity that the pendulum of a single centrally located clock, beating seconds, could regulate the local time-reckoning of every city on the face of the earth.

Table of standards governing the hour-section system of time-reckoning.

Longitude from Greenwich.	Hour meridians.		Simultaneous hours in the several sections.
	Proposed names of sectional times.	Numbers.	
°			
180	Transition time	0 or 24th	12 midnight.
165 W.	Alaskan time	1st	1 a. m.
150 W.	Hawaii time	2d	2 a. m.
135 W.	Sitka time	3d	3 a. m.
120 W.	Pacific time (adopted in United States and Canada)	4th	4 a. m.
105 W.	Mountain time (adopted in United States and Canada)	5th	5 a. m.
90 W.	Central (American) time (adopted in United States and Canada)	6th	6 a. m.
75 W.	Eastern (or coastwise) time (adopted in United States and Canada)	7th	7 a. m.
60 W.	La Plata time	8th	8 a. m.
45 W.	Brazilian time	9th	9 a. m.
30 W.	Central Atlantic time	10th	10 a. m.
15 W.	West African time	11th	11 a. m.
0	International or universal time (used in Great Britain)	12th	12 noon.
15 E.	Continental time (used in Sweden)	13th	1 p m.
30 E.	Bosphorus time	14th	2 p. m.
45 E.	Caucasus time	15th	3 p. m.
60 E.	Ural time	16th	4 p. m.
75 E.	Bombay time	17th	5 p. m.
90 E.	Central Asian time	18th	6 p. m.
105 E.	Siam time	19th	7 p. m.
120 E.	East Asian time	20th	8 p. m.
135 E.	Japan time	21st	9 p. m.
150 E.	East Australian time	22d	10 p. m.
165 E.	New Caledonian time	23d	11 p. m.

I have no desire, however, to press on the Conference the consideration of the question of local time reckoning. But, as the system adopted in the United States and Canada has proved successful, and is now firmly established, I have deemed it proper that a statement of this

fact and of the possibilities of the application of the system to other parts of the world should be made to the congress. I will now, therefore, withdraw my amendment.

Mr. RUTHERFURD, delegate of the United States. The delegate of Italy has moved, as an amendment to the first part of the resolution offered by me, the fifth resolution adopted in the Conference at Rome. Really, in spirit and in substance, there is little or no difference between them, except that the Conference at Rome has specified that the objects they had in view as suitable for regulation by universal time were these, namely: "For the internal service of the great administrations of means of communication, such as railways, steamships, telegraphs, and post-offices."

Now, I submit that in the words used in my resolution all this is embraced, and a good deal more, for this universal day is to be adopted "for all purposes for which it may be found convenient." If it were desirable that every purpose for which the universal day may be found convenient should be specified, it would make a very long resolution. On the other hand, however, we might find in the end that we had omitted some of the purposes for which it was eminently convenient. It appears, also, that in this same fifth Roman resolution all questions of chronology of universal date, &c., are omitted, although they are brought forward and appear in the sixth resolution. It seems to me, Mr. President, that nothing would be gained by the adoption of this amendment, for everything that is embraced there is more comprehensively embraced in the original resolution.

General STRACHEY, delegate of Great Britain. In explanation of the amendment offered by the delegate of Italy, let me call attention to what really passed at the Roman Conference. I find, first of all, in the report of the Roman Conference, in the abstract of the dicussion before the special committee, these words (p. 49 of the reprint):

> The fourth resolution, in favor of a universal hour for certain scientific and practical purposes, is unanimously adopted.

There appears no discussion whatever upon it; not a word seems to have been said as to how it should be defined or acted upon. I then turn back to the report of the committee which prepared the resolutions, and there we see what, in reality, they had in their minds when they drew up that resolution. It is perfectly evident that they had no intention of tying the hands of anybody. This is what they say on page 26 of the report:

> The administrations of railroads, of the great steamship lines, telegraph lines, and postal routes, which would thus secure for their relations with each other a uniform time, excluding all complication and error, could nevertheless not entirely avoid the use of local time in their relations with the public. They would probably use the universal time only in their internal service, for the rules of the road, for the time tables of their engineers and conductors, for the connection of trains at frontiers, &c.; but the time-tables for the use of the public could hardly be expressed otherwise than in local or national time. The depots or stations of the railroads, post-offices, and telegraph offices, and the waiting-rooms, could exhibit outwardly clocks showing local or national time, while within the offices there would be, besides, clocks indicating universal time. Telegraphic dispatches could show in future the time of dispatch and of receipt, both in local and universal time.

Now, I think that the subject of universal time is dealt with in a better manner in the proposition offered by Mr. Rutherfurd than in the proposition which emanated from the Congress at Rome. This Conference cannot designate positively the manner in which local time may be best reckoned. We are concerned now only with universal time. It may, however, be proper that the resolution offered by Mr. Ruther-

furd in regard to the employment of universal time should be supplemented by something more specific—something, for instance, of this sort:

"The conference will not designate the system on which local time may best be reckoned so as to conform, as far as possible, to universal time; this should be determined by each nation to suit its convenience.

The arrangements for adopting universal time for use of international telegraphs will be left for regulation by the telegraph international congress."

This last idea was expresed, I forget now by whom, but by one of the delegates since the Conference met, and it appears to me that inasmuch as there is an international congress specially appointed to regulate all matters of international telegraphy, this subject can be left to them with the firm belief that it will be regulated satisfactorily.

The question was then put to the vote; and upon the amendment offered by the delegate of Italy the following states voted in the affirmative: Colombia, Italy, Netherlands, Paraguay, Spain, Sweden.

The following voted in the negative: Brazil, Chili, Costa Rica, France, Germany, Great Britain, Guatemala, Hawaii, Japan, Liberia, Mexico, Russia, Salvador, San Domingo, Switzerland, Turkey, United States, Venezuela.

Austria-Hungary abstained from voting.

Ayes, 6; noes, 18; abstaining, 1.

So the amendment was lost.

Mr. RUTHERFURD, delegate of the United States. Mr. President, it has been represented to me that it may, perhaps, be found advantageous in different countries and different localities to use a time that would not be accurately described as local time. In one place the standard of time may be strictly local time; in another place it may be national time; in another place it may be railroad time.

In order to meet this condition of things, I propose to alter the phraseology of the original resolution in this way: by inserting the words "or other," so that it shall read "which shall not interfere with the use of local or *other* time where desirable."

Professor ADAMS, delegate of Great Britain. May it not be better to put it in this way: "Which shall not interfere with the use of local or other *standard* time where desirable."

Mr. RUTHERFURD, delegate of the United States. I accept the amendment offered by the delegate of Great Britain.

Mr. JEAN VALERA, delegate of Spain. As I consider that both the amendment which was just rejected and the present proposition really signify the same thing, I shall vote for the proposition, as I before did for the amendment.

The PRESIDENT. The question is now upon the resolution as modified. It will be read.

The resolution was then read, as follows:

Resolved, That the Conference proposes the adoption of a universal day for all purposes for which it may be found convenient, and which shall not interfere with the use of local or other standard time where desirable.

The following states voted in the affirmative: Austria-Hungary, Brazil, Chili, Colombia, Costa Rica, France, Great Britain, Guatemala, Hawaii, Italy, Japan, Liberia, Mexico, Netherlands, Paraguay, Russia, Salvador, Spain, Sweden, Switzerland, Turkey, United States, Venezuela.

There were no negative votes.

Germany and San Domingo abstained from voting.

Ayes, 23; noes, 0; abstaining, 2.

So the resolution was carried.

Mr. RUTHERFURD, delegate of the United States. Mr. President, I now propose to offer the other portion of the resolution, or rather I propose to offer the other portion in the form of a distinct resolution. It will run as follows:

Resolved, That this universal day is to be a mean solar day; is to begin for all the world at the moment of midnight of the initial meridian, coinciding with the beginning of the civil day and date of that meridian; and is to be counted from zero up to twenty-four hours.

This is, in substance, the resolution adopted by the Conference at Rome, with the exception that the Conference at Rome proposed that the universal day should coincide with the astronomical day instead of the civil day, and begin at Greenwich noon, instead of Greenwich midnight.

Professor ADAMS, delegate of Great Britain. I desire to make one remark merely. Would it not be a little more correct if we said "at the moment of mean midnight?" I think I have mentioned this before, but, to be clear, I think it should be made.

Mr. Rutherfurd accepted Professor Adams's suggestion.

Mr. JUAN VALERA, delegate of Spain. Mr. President, I wish to call special attention to the proposition now before us, on which we are called upon to vote, as it is of very great importance.

As for me, I acknowledge that my mission is already fulfilled. The Government of Spain had directed me to admit the necessity or the usefulness of a common prime meridian, and also to accept the meridian of Greenwich as the universal meridian. I have attended to these directions.

We have now to deal with a scientific question on which I cannot well express an opinion, as I do not feel that I am competent in such matters; besides, I am not authorized to do so. This may be due to my ignorance in matters of this kind, but I fear that extraordinary difficulties may arise in the adoption of this proposition, and if we proceed with too great haste, we run the risk of placing ourselves in contradiction to common sense. All the popular ideas of men for thousands of years past will, perhaps, be overturned. It may happen that when the day begins at Greenwich it will be 23 hours later at Berlin. The east will be confounded with the west, and the west with the east. If we made the day begin at the anti-meridian these questions would be avoided, and we should at once be with the rest of the human race. I believe that it would be better to adjourn till to-morrow to give us time to reflect; in this way we shall not risk by our devotion to science drawing upon ourselves popular criticism.

I propose, therefore, that the vote on this question be put off till to-morrow.

Mr. LEVFAIVRE, delegate of France. Not to-morrow.

Count LEWENHAUPT, delegate of Sweden. I beg to propose as an amendment the sixth resolution adopted by the Conference at Rome, which is as follows:

The Conference recommends as initial point for the universal hour and the cosmic day the mean midday of Greenwich, coinciding with the moment of midnight or the beginning of the civic day at the meridion 12 hours or 180° from Greenwich.

The universal hours are to be counted from 0 up to 34 hours.

The PRESIDENT. The chair quite concurs with the delegate of Spain

in thinking that it would be very proper for us to take some time to consider this matter.

A motion to adjourn would be in order, but before that motion is made, the chair would like to read a communication which he has just received from the Assistant Secretary of State. It is this:

The President of the United States will receive the members of the Conference on Thursday, the 16th instant, at 12 o'clock, at the White House.

The Assistant Secretary of State proposes that we shall meet here at a quarter before 12, and go to the White House from this hall.

The PRESIDENT. If the delegate of Spain will withdraw his motion to adjourn for one moment, the delegate of Sweden desires to offer a resolution.

Count LEWENHAUPT, delegate of Sweden, then read the following proposal:

Hereafter the reports of the speeches, whether in English or French, will be sent as soon as possible to the delegates who made them, and the proofs should be corrected and returned by them without delay to the secretary. No correction will be allowed afterward, except such as are considered necessary by the secretaries, who will meet as soon as possible after the first corrections shall have been printed to prepare the protocols for the approval of the Conference.

The motion being put to a vote by the president, was unanimously carried.

The PRESIDENT. The chair would very informally state that he has received to-day a letter from Sir William Thomson, the distinguished scientist who addressed the Conference yesterday, expressing his regret that he did not then say something which he had in his mind, and which he wished to say, namely, that the meridian of Greenwich passes directly through the great commercial port of Havre.

Mr. JANSSEN, delegate of France. Since the chairman refers to this subject, I may state to my colleagues that I have received a telegram from Sir William Thomson, in which he makes certain propositions of the nature described. Yet it is not possible to make out precisely by this telegram what are Sir William Thomson's ideas. All that I can say, is that whatever proceeds from such an eminent man should be treated with great consideration, and that is a reason for asking Sir W. Thomson to be good enough to explain to me his ideas more fully. If we could adjourn to Monday I think that it would be better. The preparation of the protocols is very much behind-hand, and it is desirable that the members of the Conference be kept fully acquainted with all the discussions. I would, therefore, suggest that we adjourn till Monday.

The PRESIDENT. There are several propositions to adjourn to different days. The chair will take them up in order and will first put the question upon the motion to adjourn until Monday.

The motion was carried, and at 4 o'clock the Conference adjourned until Monday, the 20th instant, at 1 o'clock p. m.

VI.

SESSION OF OCTOBER 20, 1884.

The Conference met, pursuant to adjournment, in the diplomatic hall of the Department of State, at 1 o'clock p. m.

Present:

Austria-Hungary: Baron Ignatz von Schæffer.

Brazil: Dr. Luiz Cruls.
Chili: Mr. F. V. Gormas and Mr. A. B. Tupper.
Colombia: Commodore S. R. Franklin.
Costa Rica: Mr. Juan Francisco Echeverria.
France: Mr. A. Lefaivre, Mr. Janssen.
Germany: Baron H. von Alvensleben, Mr. Hinckeldeyn.
Great Britain: Sir F. J. O. Evans, Prof. J. C. Adams, Lieutenant-General Strachey, Mr. Sandford Fleming.
Gautemala: Mr. Miles Rock.
Hawaii: Hon. W. D. Alexander.
Italy: Count Albert de Foresta.
Japan: Professor Kikuchi.
Liberia: Mr. William Coppinger.
Mexico: Mr. Leandro Fernandez, Mr. Angel Anguiano.
Netherlands: Mr. G. de Weckherlin.
Paraguay: Capt. John Stewart.
Russia: Mr. C. de Struve, Major-General Stebnitzky, Mr. J. de Kologrivoff.
San Domingo: Mr. de J. Galvan.
Spain: Mr. Juan Valera. Mr. Emilo Ruiz del Arbol, Mr. Juan Pastorin.
Sweden: Count Carl Lewenhaupt.
Switzerland: Col. Emile Frey.
Turkey: Rustem Effendi.
United States: Rear-Admiral C. R. P. Rodgers, Mr. Lewis M. Rutherfurd, Mr. W. F. Allen, Commander W. T. Sampson, Prof. Cleveland Abbe.
Venezuela: Dr. A. M. Soteldo.

Absent:

Denmark: Mr. C. S. A. de Bille.
Hawaii: Hon. Luther Aholo.
Salvador: Mr. Antonio Batres.

The PRESIDENT. Some days ago a committee was appointed to report on communications addressed to the Conference through the chair. All communications that have been received from time to time, and they have been numerous, have been referred to this committee, of which the delegate from England, Professor Adams, is the chairman. He now informs the chair that he is prepared to make a report.

The delegate of England, Professor Adams, then read the following report:

LETTER FROM THE PRESIDENT OF THE CONFERENCE.

INTERNATIONAL MERIDIAN CONFERENCE,
DEPARTMENT OF STATE, WASHINGTON, *October* 14, 1884.

SIR: I have the honor to submit to the committee of which you are the chairman the following communications:

No. 1. Letters from Mr. Roumanet du Cailland, through Mr. Hunter, Assistant Secretary of State.
No. 2. Letter and communication from Mr. C. M. Raffensparger.
No. 3. Letter from Mr. A. S. de Chancourtois, accompanying books from Paris.
No. 4. Letter from Mr. A. R. Spofford, inclosing letter of Mr. J. W. Stolting, of Dobbs' Ferry.
No. 5. Letter from Mr. B. Aycrigg, Passaic, N. J.
No. 6. Letter from J. T. Field, Saint Louis, Mo.
No. 7. Letter and two inclosures from Mr. Theodor Pæsche.
No. 8. Description of the universal time-piece of Dr. A. M. Cory.
No. 9. Letter and inclosure from Mr. E. R. Knorr.
No. 10. Letter from Mr. J. E. Hilgard, of the United States Coast and Geodetic Survey.

No. 11. Arguments by committee of New York and New Jersey branch, and other papers relating to weights and measures.
No. 12. Letter from Lieut. C. A. S. Totten, U. S. A., in relation to a standard meridian.
No. 13. Letter from Mr. J. P. Merritt, in relation to the metric system.
No. 14. Postal card from W. H. Yates, in relation to the Mercator projection.
No. 15. A new system of mensuration, by Lawrence S. Benson.
No. 16. Letter of T. C. Octman, of Hope Mills, N. C., calling attention to the fact that the meridian of Greenwich passes through Havre.
No. 17. Letter from Dr. H. K. Whitner, explaining his notation of twenty-four hours.

I am, sir, with great respect, your obedient servant,

C. R. P. RODGERS,
President International Meridian Conference.

Prof. J. C. ADAMS.

REPORT OF THE COMMITTEE.

The committee on communications respectfully reports as follows:

We have carefully examined all of the communications referred to us, as enumerated in the letter of President Rodgers, with the following results:

No. 1 recommends that the meridian of Bethlehem be adopted as the initial meridian. This question has been already disposed of by the Conference; therefore further consideration of the proposition is unnecessary.

No. 2 refers to an invention, the author of which states that "a patent has been applied for," consequently your committee does not feel called upon to express any opinion upon it.

No. 3 is a letter from M. de Chancourtois, accompanying a work by him which contains an elaborate programme of a system of geography based on decimal measures, both of time and of angles, and on the adoption of an international meridian.

The work also contains copious historical notices on the metric system and on the initial meridan.

A copy of this work was presented to each of the delegates prior to the discussions of the Conference with regard to the choice of an initial meridian, and therefore no special report of the author's views on this subject appears to your committee to be necessary. These views are nearly identical with those which were so ably laid before the Conference by Professor Janssen, but which failed to meet with their approval.

The author further proposes to supersede the present mode of measuring both angles and time by a system in which the entire circumference and the length of the day should each be first divided into four equal parts, and then each of these parts should be subdivided decimally.

However deserving of consideration these proposals may be, in the abstract, your committee are clearly of the opinion that they do not fall within the limits indicated by the instructions which we have received from our respective Governments, and that, therefore, any discussion of them would only be of a purely academical character, and could lead to no practical result. Such a discussion would be sure to elicit great differences of opinion, and would, therefore, occupy a considerable time.

Hence your committee think that it would be very undesirable for the Conference to enter upon it.

No. 4 is a letter from Mr. Spofford, Librarian of Congress, including a communication of Mr. J. W. Stolting, Dobbs' Ferry, New York. The author recommends the adoption of the meridian 162° west from Greenwich as the prime meridian; he proposes further not to say east or west, but first or second half, and also recommends the adoption of a universal time, not to interfere with local or other standard time, and to reckon from "1 to 24." He expresses no opinion as to whether the day should begin at noon or midnight. There seems to be nothing in the communication to influence the decisions of the Conference.

No. 5. See report as to letter No. 1.

No. 6 suggests that the prime meridian should be 180° from Greenwich, and that longitude should be reckoned from 0° to 360°. This proposition has been already considered and rejected by the Conference.

No. 7. This communication proposes "to adopt as the prime meridian the frontier line between Russia and the United States, as defined in the treaty of March 30, 1867." As the initial meridian has already been agreed to by the Conference, this proposition needs no further notice.

No. 8. This communication refers to an invention which has no bearing on the question before the Conference. The committee therefore abstain from expressing an opinion as to its merits.

No. 9. Two letters from Mr. E. R. Knorr, of Washington, D. C., advocating the advisability of reckoning longitude "westward from 0° to 359°," and marking them on charts by time instead of by degrees. The Conferenee has already taken action on the question involved.

No. 10. A letter from Professor Hilgard, inclosing a pamphlet by Lieut. C. A. S. Totten on the metrology of the great pyramid, a subject which does not fall within the scope of the subjects presented for the consideration of this Conference. In the inclosing letter Professor Hilgard says, "I am purely and squarely for Greenwich midnight as the beginning of the universal day, and an east and west count of longitude—that is, 180° each way."

No. 11 advocates the preservation of the Anglo-Saxon system of weights and measures. This subject being foreign to the questions under consideration by this Conference, the committee deems further comment unnecessary.

No. 12. A letter from Lieut. C. A. S. Totten, U. S. A., advocating a prime meridian through the great pyramid. The proposition involved has already been decided by the Conference.

No. 13 recommends redistribution of time according to the decimal system. As already remarked under No. 3, this proposition is clearly not within the limits indicated by the instructions which we have received from our respective Governments.

No. 14 states that the author has a plan by which "chronometers will record the longitude equably." This proposition is foreign to the subjects under consideration by the Conference.

No. 15 proposes a new system of mensuration, and, therefore, this does not fall within the subjects for consideration by the Conference.

No. 16. This communication suggests that, as the prime meridian passes through Havre, it should be allowable to call it by that name. This committee recommends that the prime meridian be not named after the localities through which it passes, but be called simply "The Prime Meridian."

No. 17 is the subject of a patent. The committee does not feel called upon to express an opinion respecting it.

This report is respectfully submitted to the Conference.

J. C. ADAMS,
Chairman Committee on Communications.

WASHINGTON, *October* 18, 1884.

The PRESIDENT. The report of the committee is before the Conference.

Mr. RUTHERFURD, the delegate of the United States. I move that the report be accepted and its conclusions adopted.

There being no objection, the report was adopted.

The PRESIDENT. In the regular order of business to day, the first subject before the Conference is the resolution offered on Saturday by the delegate of the United States, Mr. Rutherfurd, with the amendment offered by the delegate of Sweden, Count Lewenhaupt.

The resolution is as follows:

Resolved, That this universal day is to be a mean solar day, is to begin for all the world at the moment of mean midnight of the initial meridian coinciding with the beginning of the civil day and date of that meridian, and is to be counted from zero up to 24 hours.

The amendment offered is as follows:

The Conference recommends as initial point for the universal hour and the cosmic day the mean mid-day of Greenwich, coinciding with the moment of midnight or the beginning of the civil day at the meridian 12 hours or 180° from Greenwich.

The universal hours are to be counted from 0 up to 24 hours.

Mr. VALERA, the delegate of Spain, said that he thought that the amendment of the delegate of Sweden should be first discussed.

Mr. JANSSEN, the delegate of France. At the last session I informed the Congress that I had received a telegram from Sir William Thomson upon the question of the meridian. Since then, that illustrious foreign member of the Institute of France has written me a very kind letter upon the subject, in which he expresses his complete appreciation of the disinterested attitude taken by France in this Congress. I thank Sir William Thomson for his sentiments toward France, and I am persuaded that with such excellent feelings we should arrive at an understanding, upon scientific bases, in which the moral and material interests of all would be equitably adjusted, as we have always understood them.

But the question is not open now, and this Congress would, doubtless, not be disposed to reopen it. Sir William Thomson will understand, therefore, that in the present condition of affairs we have only to maintain the attitude which we have taken and the votes which we have given.

The PRESIDENT. The chair will simply say to the Conference that he very informally alluded to the letter that he had received from Sir William Thomson, and the chair would also say in answer to the Spanish minister that the rule in this Conference, a simple one, is to discuss the last amendment offered and dispose of it, instead, as suggested by the delegate of Spain, of taking up the one most important in its character. It would be somewhat difficult for the chair to decide on all occasions which amendment is the most important. I think, therefore, as chairman, that I will pursue the rule in force in this country, and, unless the Conference order otherwise, shall present the amendment which is the last offered.

Mr. RUIZ DEL ARBOL, delegate of Spain. Mr. Chairman, the Spanish minister has not referred to the most important amendment, but to the most radical. For instance, here there are several propositions to select a meridian; one of them must be considered, and it seems to me that my amendment, which is the most radical, is the one to be first presented to the Conference.

The PRESIDENT. Unless the Conference shall direct otherwise, the chair must pursue the principle on which it has acted hitherto, taking the amendments in the order in which they are offered, and presenting them inversely for the action of the Conference. The proposition before the Conference, therefore, is the amendment offered by the delegate of Spain, Mr. Arbol, which is as follows:

> Having accepted the meridian of Greenwich to account the longitudes, as a general need for practical purposes, but thinking that the introduction of any new system of time-reckoning is far more scientific and important, and liable to great difficulties and confusion in the future, we propose the following resolution:
>
> *Resolved*, The Congress, taking in consideration that there is already a meridian tacitly accepted by almost all the civilized nations as the origin of dates, the antimeridian of Rome, abstains from designating any other meridian to reckon the universal time.

Mr. RUIZ DEL ARBOL, delegate of Spain. It is proposed to introduce an absolute, universal, or cosmopolitan system of time-reckoning, which, it is hoped, will, at a more or less distant day, be generally adopted, not only for scientific purposes but for all the ordinary purposes of life for which it can possibly be used; and it is further proposed to designate a meridian at which this cosmopolitan time-reckoning is to begin. What I have to state is that this method of absolute time-reckoning already exists (although we do not use it), as does this universal meridian which has been tacitly chosen by almost all civilized nations—that is to say, by all such as have adopted the Julian calendar, with or without the Gregorian correction. Thus it is that anything involving even a slight modification of our present system is nothing more than a chronological reform, which I do not feel certain that it will be well for us to introduce or recommend, and with regard to which I have my doubts whether it will be received with unanimous or hearty approval.

In fact, gentlemen, all nations that have adopted the Julian and Gregorian systems of time-reckoning have necessarily accepted their consequences, and these consequences are, as Rome told us in the time of Cæsar and in that of Gregory XIII, that we must reckon our days ac-

cording to certain fixed dates; some part of the world had to reckon their dates before all the rest, and as Rome consented that countries situated to the east of it should reckon their date before it and countries situated to the west after it, it is evident that both reckonings had to meet at some point on some meridian, which was and could be no other than the anti-meridian of Rome. Nature itself seems to have lent its sanction to this, since the anti-meridian of Rome crosses no continent, and probably no land whatever.

Let us suppose, for the sake of illustration, that it were agreed to abandon the Gregorian system of reckoning at a given moment and to adopt another; that it were agreed to abandon it at all points on the globe when the hour should be 12 o'clock at noon at Greenwich on the 1st day of January, 1885; and let us suppose that for historical or scientific purposes we were interested in knowing exactly how long the Gregorian system had been in use. Is it possible to ascertain this? It is; and very easily. Using that system of universal time-reckoning which it is proposed to establish, but logically referring it to the origin of that cosmopolitan reckoning which really exists, that is to say, to the anti-meridian of Rome, we shall find that 1885 years have been reckoned according to the Gregorian system, plus the difference of longitude between the anti-meridians of Greenwich and Rome. Nothing is more certain than this, and there is no other way of solving the problem. As I have already shown, when the Gregorian correction was made, the day which, according to the old mode of reckoning, would have been the 5th of October, was called the 15th of October, 1582; the countries situated to the east of Rome had, however, previously begun to reckon according to the new system (previously in absolute time, I mean) and the countries situated to the west adopted it successively afterwards. Now, then, as that portion of the globe which lies to the east of any given point or meridian is nothing more or less than one hemisphere, and as that which lies to the west is another hemisphere, it is evident that, at the anti-meridian of Rome, the two meridians, which constantly differ by one day in their dates, are confounded, and that the anti-meridian of Rome, being the first one in the world that adopted the Julian and the Gregorian systems of reckoning, is the prime meridian of the world; the meridian by which we now reckon, and ought to reckon, universal time until the establishment of a different system. If we had, at the present time, to settle any question depending on dates in the region where there is some confusion in regard to them, we should have to do so on this principle. If we desired to compel the entire world to keep a regular and logical account of dates, we should have to do so by compelling all the nations to the west of the anti-meridian of Rome to go on reckoning their dates uninterruptedly after they have begun to be reckoned at the said anti-meridian, and by forbidding all the nations to the east of it to reckon any date until it has been reckoned at the anti-meridian of Rome. For this reason I say that the express designation, for the reckoning of universal time, of the meridian of Greenwich or of any other than the anti-meridian of Rome, involves a chronological reform, inasmuch as it will involve the abandonment of the system to which we now adhere, and which we now use by common consent.

This reform will cause a change of nearly thirteen hours—that is to say, twelve hours plus the difference of longitude between Rome and Greenwich, if the meridian of Greenwich is designated as the new initial point of the universal date. I do not believe, however, that you will adopt this choice irrevocably, since its curious and strange conse-

quences may be shown by one example which I will adduce: This table is of about sufficient extent to allow the difference between the geographical longitude of its two ends to be observed and appreciated. Let us suppose that these sessions were held at Greenwich, and that the table were placed east and west, so that the meridian intersected it lengthwise; let us further suppose that we had agreed to reckon the new universal time by this meridian—that is to say, by that of Greenwich—and that, in signing the protocol, we wished to set an example to the world by using the universal date, the present civil date, and the future civil date, which, by the daily use of the universal date, the nations will or may finally accept, to the exclusion of all others, for the ordinary purposes of life. Well, now, gentlemen, we should bring our own choice into discredit. We could not sign according to these three dates. As regards the last, we should find that half the table and half the Congress were under one date and the other half under another; even our chairman, if seated in the middle, would find that he had been presiding over our sessions with his right side in one day and his left in the next.

I may be told that this would happen whatever might be the meridian chosen, but we could afford to allow it to happen at sea, or in some isolated and uninhabited region where congresses never sit, and where no ray of civilization ever penetrates.

But to return to the reform: What are you going to do? I will say that if, instead of the meridian of Greenwich, you designate the anti-meridian for the reckoning of universal time and for the initial point of cosmopolitan dates for the present but for the future as the initial point also of local dates, the reform will amount to about an hour only, but it will still be a reform. In a word, the anti-meridian of Rome is the one which now furnishes dates to the entire world, and you propose to make the meridian of Greenwich or the anti-meridian do so in future.

I therefore tell you, if you desire a common hour for postal and commercial purposes, designate no meridian at all; let the railway and telegraph companies, the postal authorities and the Governments, make an arrangement and select an artificial hour, so to speak, whatever it be—the hour of Rome, London, Paris, or even that of Greenwich—but do not make a premature declaration, which will be an authoritative one as emanating from this Congress, an apparently insignificant reform, but in reality one of very great importance, since, giving the preference to determinate localities in the face of what is scientific, historical, and logical, you render difficult in the future the adoption of that very reform which will, perhaps, then be more necessary, and which can, perhaps, then be introduced more intelligently.

You see that I am not speaking in behalf of any special meridian, not even that of Rome, since I admit that the reform may be necessary. You see, and I assure you, that I have not the slightest wish that the meridian which is to be the initial point of universal time should bear the name of any observatory or place in Spain, although that nation discovered the New World in which this Congress is holding its sessions, and although it may be said of that nation that it discovered those very meridians concerning which we are now speaking, inasmuch as terrestrial meridians were indefinite and unknown lines, and were even without form until one was given them by Sebastian Elcano. I therefore hope that if you do not honor my proposition by accepting it, you will at least do justice to my intentions.

Professor ADAMS, delegate of Great Britain. Mr. President, I shall

be very short in any remarks which I may make upon the proposition before us.

As far as I understand it, it is that although we have adopted the meridian of Greenwich as a prime meridian from which to count longitudes, we should begin to count our time according to the meridian at Rome. I cannot consent to that proposition. It appears to me to be wanting in every element of simplicity, which should be our chief aim in this Conference. To count longitude from one meridian and time from another is something that will never be adopted. I do not understand that that was at all the proposition recommended by the Roman Conference. On the contrary, I think that it was quite a different one.

Mr. RUIZ DEL ARBOL, delegate of Spain. Mr. President, I do not in reality propose to adopt the meridian or anti-meridian of Rome. What I have been contending for is that we should abstain at present from adopting any meridian as a point of departure for the calculation of time; otherwise, we introduce a new element of confusion for the future. We should change the chronological reckoning which is now in vogue, and I contend that we have no right, scientific or historical, to make that change now. According to my views, the meridian of longitude is relatively an unimportant affair. It is a practical one; it cannot be changed in twenty years, probably, and it will take that time to correct all existing charts. But if you adopt a meridian for time, it will be very difficult to alter it in the future. I cannot now clearly see what the difficulties will be, but I apprehend that the application of this new principle to the various details of scientific and civil matters will necessarily be attended with great inconvenience, and may result in proving to be quite impracticable. I understand it very well that it is proposed to confine this principle to certain subjects, and that it is adopted for the purpose of avoiding dangers in communications, in navigation, in railways, and in transmitting telegrams, &c.; but this is purely an administrative matter, and can be left for settlement to other bodies.

The PRESIDENT. The chair would remind the delegate of Spain, Mr. Ruiz del Arbol, that at its last session the Conference resolved, with singular unanimity, that it was expedient to adopt "a universal day for all purposes for which it may be found convenient, and which shall not interfere with the local or other standard time where desirable." The chair would politely suggest that the subject now under consideration is the adoption of the proposition recommended by the Conference at Rome, and which has been presented here by the delegate of Sweden, Count Lewenhaupt.

Mr. RUIZ DEL ARBOL, delegate of Spain. My proposition is to abstain from the adoption of any one meridian, and that we leave the matter to some other Congress, organized with the special object of regulating this question.

Commander SAMPSON, delegate of the United States. Mr. President, as near as I can follow the delegate of Spain, he seems to be under the apprehension that by the adoption of the universal day, which has been proposed here, we should either gain or lose time in our chronology; that we should skip 12 hours more or less. But, of course, that is not the case. Any event which has occurred, or which will occur, at the time of the adoption of the universal day will be expressed just as exactly with reference to time as if the time had been calculated from the beginning of the Christian era. There will not only be no confusion, but it seems to me the adoption of the universal day will tend to avoid confusion hereafter, because confusion must exist where we have so many standards of time. Now, if any event which is taking place, or

has taken place at any past time in the history of the world, is referred to the prime meridian, or is expressed in the time of any locality or of several localities, these times will be all different. The adoption of the universal day is to avoid any difficulty of that sort, and any event which has transpired will, when expressed in the time of the universal day—that is, according to the universal method—represent exactly the interval of time which has elapsed since the beginning of the Christian era. Nothing is gained or lost.

General STRACHEY, delegate of Great Britain. It seems to me that the Congress having accepted the resolution to which reference was made a little while ago, adopting the universal day, it is incumbent upon us, in the nature of things, to determine when that universal day shall begin. The resolution presented by the delegate of the United States proposes to define how that universal day shall be reckoned; that is, when it shall begin and how its hours shall be counted.

It was explained by him that the difference between his proposition and the proposition made at Rome consisted in altering the time of the commencement of the so-called universal day from noon at Greenwich to the commencement of the civil day. Certainly what Commander Sampson just said is perfectly true. The adoption of this so-called universal day will not interfere in the smallest degree with any purpose for which time is employed in civil life. The two objects are entirely distinct. It is obvious that the conception of the necessity of having a universal day has arisen from the more clear conception of the fact that time on the globe is essentially local; that the time upon any given line (supposing it to be a meridian) is not the time at the same moment on either side of that line, however small the departure from it may be; and for scientific accuracy it has, therefore, been thought desirable to have some absolute standard to which days and hours can be referred. Up to the present time it has been the practice to say, in an indefinite way, that an event happened, say, on the 1st of January at 6 o'clock in the morning, and such a statement of the time has been considered sufficient; but, in truth, this does not completely describe a definite epoch of time, for if the event occurred at Madrid and was so reported, that report would not designate the same moment as a report of an event which was described to have occurred at precisely the same date and hour at Greenwich, or Rome, or Washington. What is required and desired is that we should have an absolute and definite standard for reckoning events of a certain description, for which complete precision is desirable. I consider, therefore, that the delegate of Spain leads us astray in the proposition which he has offered, by which he virtually proposes to nullify the resolution already adopted. We have already decided that a universal day was expedient, and it is for the Conference to settle now when that universal day shall begin.

Mr. RUIZ DEL ARBOL, delegate of Spain. I understand that the consequences, perhaps, would not be troublesome at first; but who can look into the future and say, if we take the meridian of Greenwich as the standard of time, what difficulties we may be driven into? Every country will be obliged to count both ways. They will have to use civil time and universal time. Perhaps all countries may get accustomed to this radical change sooner or later, but we cannot foresee the difficulty now. I have here a treatise (a book) on "Analytic Chronology," showing the rules by which to bring into accord different dates of different calendars and eras, and I do not know how they would be affected by this universal time; but it is unnecessary for me to speak of that, as I think you are acquainted with the subject.

Mr. JUAN PASTORIN, delegate of Spain. The Congress has already come to very important decisions on the subject of the reckoning of longitude, and it will always certainly approve to-day those which have just been submitted on the subject of the universal day.

I say certainly, because the result of the former votes being already known, it cannot be doubted on which side the majority will be, and because, from a scientific point of view, having chosen Greenwich as the prime meridian for the calculation of longitude, and having decided to reckon longitude in two directions from zero hours to twenty-four hours, with the sign plus towards the east and minus towards the west, it will be advantageous to make the civil day of Greenwich coincide with the universal day, if we would have an easy formula for passing from local to cosmic time.

So many of the resolutions submitted to the Congress by Mr. Rutherfurd having been approved one after another, the plan that our colleague has carefully studied will be accepted in its entirety; but it will be impossible for the Conference to know in all their details other plans which, perhaps, would not be less worthy of attention.

Is the resolution adopted by a majority of the Congress the best? Should we reach the end of the reform in complete harmony with the hopes of all the governments represented here? On the contrary hypothesis, it seems to me that the sessions of this Congress will only be another step towards that reform, but not the reform itself.

If the majority of the Congress, in accordance with the logical consequence of its work, adopts as the cosmic time the civil time of Greenwich, that decision will be contrary to the most ancient ideas of the human race. For many centuries the day has been reckoned as starting from the east, and the world will not easily abandon the traditions of its predecessors.

The civil day of the world commences near the anti-meridian of Rome, Greenwich, or Paris. Therefore it is not natural that one of these meridians should be chosen as the point of departure of dates.

Really, one phenomenon cannot be the commencement of a series of phenomena if there is another which precedes it periodically.

If the majority, as is logical, adopts the formula, "cosmic time = local time — longitude," and applies in the calculation longitude with the signs plus and minus, according as the longitude is east and west, the system will be source of frequent mistakes, and those, in their turn, will be the cause of disastrous accidents, especially on railroads.

Let us take the 31st of December, for instance. It is three o'clock at a point nine hours east of Greenwich; at the same moment they will count at Greenwich eighteen civil hours of the 30th of the same month, after the actual manner of reckoning the civil day, and that civil time of Greenwich will be the cosmic time.

Apply to the proposed example the formula which I suppose the majority of the Congress will adopt, and the result will be a negative quantity, minus six hours—a result not sufficiently comprehensible in itself, and one that could not be easily applied by the general public.

Can a majority prevail in questions, such as those we are speaking of, simply by the force of numbers? The whole world for several centuries thought that the earth was the center of our planetary system; in fact, until an insignificant minority rose against this theory, for a long time considered by their ancestors indisputable.

I will conclude by expressing my opinion upon the subject with which the Congress is occupied. My opinion is not new, in spite of its having been modified in the course of our sitting. The works of our eminent

colleague and indefatigable propagandist, Mr. Sandford Fleming, the resolution of the Conference at Rome, the valuable opinions of Messrs. Faye, Otto Struve, Beaumont de Boutiller, Hugo Gyldén, the scientific work of Monsieur Chancourtois, and the report which M. Gaspari has just presented to the Academy of Sciences of Paris are the text upon which I base the simplest and most practical method of solving the problem, namely, to adopt as the prime meridian for cosmic time and longitude a meridian near the point at which our dates change, and to reckon longitude from zero hours to twenty-four hours towards the west, contrary to the movement of the earth. The formula would be then: Cosmic time = local time + longitude.

I think that the best way of finding cosmic time in relation to local time and longitude is to add a quantity to the civil hour of each point of the globe.

But as the majority of this Congress, so worthy of respect, admits no modifications of the system which we may call Greenwich, let us lay aside the question of longitude and consider cosmic time separately.

I have the honor, therefore, to present the following resolutions, and I ask the Congress to consider them, and to accept them as a means of compromise:

I. We agree to choose as the prime meridian for cosmic time that meridian near which the civil day of the world commences, namely, the anti-meridian of Rome, Greenwich, or Havre.

II. The cosmic day consists of twenty-four hours, and commences at midnight of the prime meridian.

III. The earth is divided from the initial meridian into twenty-four hour-spaces, counted in a direction contrary to the movement of the earth from 0 hours to 24 hours.

We shall, then, have the following formula: $T = t + R$, where R represents the difference reckoned from 0 hours to 24 hours between the local time of the prime meridian and the local time of each point of the globe; T the cosmic time, and t the local time.

The PRESIDENT. The chair would ask the delegate of Spain, Mr. Pastorin, whether he offers his resolution as an amendment to that offered by his colleague, Mr. Ruiz del Arbol.

Mr. RUIZ DEL ARBOL, delegate of Spain. Mr. Chairman, the amendment last offered is not intended to interfere with my proposition.

The PRESIDENT then put the question to the Conference upon the amendment offered by the delegate of Spain, Mr. Ruiz del Arbol.

Upon a vote being taken, the amendment was lost.

The PRESIDENT. The question now recurs upon the amendment offered by the delegate of Spain, Mr. Pastorin. That amendment runs as follows:

I. We agree to choose as the prime meridian for cosmic time that meridian near which the civil day of the world commences, namely, the anti-meridian of Greenwich or Havre.

II. The cosmic day consists of twenty-four hours, and commences at midnight of the prime meridian.

III. The earth is divided from the initial meridian into twenty-four hour spaces, counted in a direction contrary to the movement of the earth.

We shall then have the following formula: $F = A + R$ where R represents the difference reckoned from 0 hours to 24 hours between the local time of the prime meridian and the local time of each point of the globe; F the cosmic time, and A the local time.

The PRESIDENT. In order that this amendment may be presented more clearly to the Conference, I would propose a recess for a few minutes. If there be no objection, a recess will be taken.

No objection being made, the Conference took a recess.

The PRESIDENT having called the Conference to order stated that, unless further remarks were presented, the vote would be taken upon the resolution offered by the delegate of Spain, Mr. Pastorin.

No objection being made, the vote was then taken upon the amendment, and it was lost.

The PRESIDENT. The question now recurs upon the resolution offered by the delegate of Sweden, Count Lewenhaupt, which will again be read.

The resolution is as follows:

The Conference recommends as initial point for the universal hour and the cosmic day the mean mid-day of Greenwich, coinciding with the moment of midnight or the beginning of the civil day at the meridian 12 hours or 180° from Greenwich. The universal hours are to be counted from 0 up to 24 hours.

Professor ADAMS, delegate of Great Britain. Mr. President, I intended to speak on the resolution offered by the delegate of the United States, Mr. Rutherfurd, but the remarks which I have put together apply equally well to the amendment to that resolution now offered by the delegate of Sweden, which is identical with one of the recommendations of the Conference at Rome, because, in fact, in my remarks I discuss these propositions alternatively. Therefore, with your permission, I will lay before you the observations which I wish to make.

I beg leave to express my entire approval of the resolution which has been laid before the Conference by Mr. Rutherfurd. There is only one point involved in the resolution which seems to call for or even to admit of any discussion.

It appears evident that the universal day and date should coincide with the day and date of the initial meridian. The only question, therefore, which we have now to decide is, When shall this day of the initial meridian be considered to commence? And the proper answer to be given to this question does not appear to me in any degree doubtful.

In modern times it is the universal practice to reckon dates by *days* and not by *nights*. The word "day" is used in two different significations, being sometimes applied to the period of daylight and sometimes to the period of 24 hours, including both day and night; but in whichever of these senses the word *day* is employed, the term "mid-day" has one and the same signification, viz, the instant of noon or of the sun's passage over the meridian. In the present case, where we are concerned with mean time, mid-day means the instant of mean noon, or of the passage of the mean sun over the meridian.

Accordingly the civil day, by which all the ordinary affairs of life are regulated, begins and ends at midnight, and has its middle or mid-day at noon.

It appears, then, most natural that the universal day should follow this example, and should begin and end at the instant of mean midnight on the initial meridian, and should have its middle at the instant of mean noon on the same meridian.

I fail, therefore, to see the force of the reasons which induced the Conference at Rome to recommend that the universal day should commence at *noon* on the initial meridian.

The only ground for making this recommendation is that astronomers, instead of adopting the use of the civil day, like the rest of the world, are accustomed to employ a so called astronomical day, which begins at noon. The advantage thus gained is that they avoid the necessity of changing the date in the course of the night, which is the time of their greatest activity; but this advantage is surely very small when compared with the inconvenience of having two conflicting methods of

reckoning dates, and of being obliged to specify, in giving any date, which mode of reckoning is adopted. If this diversity is to disappear, it is plain that it is the astronomers who will have to yield. They are few in number compared with the rest of the world. They are intelligent, and could make the required change without any difficulty, and with very slight or no inconvenience.

The requisite changes in the astronomical and nautical ephemerides would be easily made. As these ephemerides are published several years in advance, there would be plenty of time for navigators to become familiar with the proposed change in time-reckoning before they were called upon to employ it in their calculations.

I believe that they would soon come to think it more convenient and natural to reckon according to civil time than according to the present astronomical time. I am told that this practice is already universally adopted in keeping the log on board ship. To avoid any chance of mistake, it should be prominently stated on each page of the ephemerides that mean time reckoned from mean *midnight* is kept throughout.

Whether or not astronomers agree to adopt the civil reckoning, I think we ought to adopt the instant of midnight on the initial meridian as the commencement of the universal day.

The relation between the local time at any place and the universal time would then be expressed by the simple formula:

Local time = universal time + longitude.

Whereas, if the proposition of the Roman Conference were adopted, we should have to employ the less simple formula:

Local time = universal time + longitude — 12 hours.

In recommending the mean noon at Greenwich as the commencement of the universal day and of cosmopolitan dates, the Roman Conference refers to this instant as coinciding with the instant of midnight, or with the commencement of the civil day, under the meridian situated at 12 hours or 180° from Greenwich. Now, this reference to the civil day and date on the meridian opposite to Greenwich appears not only to be unnecessary and to be wanting in simplicity, but it may also lead to ambiguity in the date, as expressed in universal days, unless this ambiguity be avoided by making an arbitrary assumption. No doubt the Greenwich mean noon of January 1 coincides with midnight on the meridian 12 hours from Greenwich, but with what midnight? What shall be its designation and the corresponding date given to the universal day? Shall we call the instant above defined the commencement of the universal day denoted by January 1 or by January 2? Each of these dates has equal claims to be chosen, and the choice between them must clearly be an arbitrary one, and may, therefore, lead to ambiguity.

By adopting Greenwich mean midnight as the commencement of the universal day, bearing the same designation as the corresponding Greenwich civil day, all ambiguity is avoided, and there is no need to refer to the opposite meridian at all.

Those are the ideas I wish to express with regard to the commencement of the universal day.

I may mention in connection with this subject that Professor Valentiner is one of the gentlemen who were invited, a week or two ago, to attend the meetings of this Conference, in order that, if requested, they might express their opinions from a scientific standpoint upon the questions before it; but as Professor Valentiner had to leave Washington before our sessions were at an end, I thought it would be expedient to ask him for his opinion in writing upon the matter which is now

pending before this Conference. He has written a letter in German expressing his opinion. I have caused that letter to be translated into English, and if the Conference allows me I will read it.

The PRESIDENT. If there be no objection to the proposition of the delegate of Great Britain the letter will be read.

No objection being made, Professor ADAMS continued: It is well known that Professor Valentiner is an eminent practical astronomer, and I think that any opinion coming from him on this subject, which interests astronomers very much, will be considered of great weight. The letter runs as follows:

CHARLOTTESVILLE, VA., *October* 12, 1884.

HONORED SIR: You had the kindness to ask me for my views as to the choice of the moment for the beginning of the day. As I cannot remain longer in Washington, I allow myself thus briefly to write to you.

When, as in the present case, the object is to introduce uniformity in the time-reckoning of the astronomical and the civil world, I am of the opinion that it is the astronomer only that must give way. For all purposes of civil life one cannot begin the day in the middle of the daylight—that is to say, in the middle of that interval during which work is prosecuted. In general it appears to me natural that the middle of the day, and not the beginning of the day, should be indicated by the highest position of the sun which governs all civil life. In fact, it would in civil life be simply impossible to bring about a change of date in the middle of the daylight. For the astronomer there certainly exist difficulties. His activity occurs mostly in the civil night, and he, therefore, has to make the change of date in the midst of his observations; and this difficulty is increased, since he almost exclusively observes according to sidereal time, so that often a computation must be made in order to ascertain whether the observations were made before or after the midnight or moment of change of date. However, this difficulty can be overcome by habit, and I believe that scarcely any doubt will occur as soon as a uniformity of expression has established itself through the astronomical world. As regards the ephemerides, we already employ, in fact, the beginning of the date at midnight, since the places of planets and comets are generally computed for 12 o'clock midnight of Berlin or Greenwich or other places. But these are points that have themselves long since been discussed.

I scarcely need to say anything further. I would not hesitate for a moment to give the preference to making the change of date take place at midnight, according to civil reckoning, in order to establish a uniformity with the customs of civil life.

It perhaps may be important to remark that we could not introduce this change immediately, since the ephemerides are already computed and published for three or four years in advance. It would, therefore, be well to fix the epoch of change of normal dates to some distant time, such as 1890.

I remain, very respectfully, yours,

W. VALENTINER.

I may also mention that the practice that prevails among astronomers at the present time of reckoning the day from noon is by no means without exceptions. There are very important astronomical tables which reckon the day from midnight; for instance, in Delambre's Tables of the Sun; in Burg's, Burckhardt's, and Damoiseau's Tables of the Moon; in Bouvard's Tables of Jupiter, Saturn, and Uranus, and in Damoiseau's Tables of Jupiter's Satellites, mean midnight is employed as the epoch of the tables. I may also mention that Laplace, in his Mécanique Celeste, adopts the mean midnight of Paris as the origin from which his day is reckoned. Hence there are great authorities, even among astronomers, in favor of commencing the day at midnight.

General STRACHEY, delegate of Great Britain. Sir, I observe that a very eminent American authority is present in this room. I mean Professor Hilgard. As he was invited to attend the meeting of this Conference, I suggest that the views of the Conference may be taken, whether he may not be invited to express his opinion on the point now under consideration.

The PRESIDENT. With the concurrence of the Conference, the chair will be most happy to ask Professor Hilgard to do us the favor to give us his opinion upon the question now before the Conference.

No objection was made to the proposition of the president.

Professor HILGARD arose and said: I thank you and the Conference very much for this invitation, and General Strachey for having proposed it to the Conference, but my opinion has been squarely expressed both in French and English in the report of a certain committee, that I am in favor of midnight at Greenwich as the beginning of the universal day, and of longitude being calculated both ways from Greenwich. I really cannot add anything to what has been said in the arguments already presented by Professor Adams, and I do not think that I ought to detain this Conference a moment by repeating the opinion he has expressed to all the experts in this matter.

I beg you will excuse me for not further ventilating my views. Absence from the city, I regret, has prevented me from availing myself of the invitation earlier.

Sir FREDERICK EVANS, delegate of Great Britain. I have the honor to address the Conference once more upon the practical aspect of the subject before us as affecting the large body of navigators. I wish to say upon this point that there appears to me, in the address of my colleage, Professor Adams, somewhat of a mixing together of two subjects.

The question immediately before us, as I understand it, is whether the commencement of the universal day shall be midnight or noon of the initial meridian. That is what we practically have to decide. Now, I gather from Professor Adams' remarks that upon this question the ephemerides which we now employ have some important bearing. I do not think that that should influence us, for this reason, that the next resolution which will come before the Conference "expresses the hope that as soon as may be practicable the astronomical and nautical days will be arranged everywhere to begin at midnight."

This resolution, so far as I understand it, will be the warning to astronomers to begin to make the changes growing out of this resolution which may be necessary for seamen. Therefore, I consider that we may at once proceed to vote upon the question whether the day is to commence at midnight or noon, without any reference to the practice or interests of navigation. In reality, it does not appear to me to affect that subject at all.

I have given some consideration to the practical bearings of this question—whether it should be midnight or noon. What we ought to decide is what will be the least inconvenience to the world at large. I have ascertained from two of my colleagues, who have given this matter the greatest consideration, that the adoption of midnight will really cause less confusion than noon, for this reason, that all the great colonies of the world would be less affected; that is to say, that the times they are using now would be less affected by midnight than by noon. That being so, it appears to me to be an essential point in coming to a settlement of this question.

Mr. RUIZ DEL ARBOL, delegate of Spain. I have only to say that I have listened to the remarks about navigators changing the reckoning of time. I do not know whether there are many navigators here, but it is a fact that seamen reckon the day from noon.

The PRESIDENT. I beg the pardon of the delegate of Spain; but, in the United States Navy, we reckon the day from midnight.

Mr. RUIZ DEL ARBOL, delegate of Spain. I am speaking generally. Now, there is some reason for this rule among seamen, for the only way to find out the position of a ship is to observe the meridian altitude of the sun; and everybody requires to know at sea what has taken place

in the course of every day, from the beginning to the last moment of the day; and I think that whatever the rule may be in the United States Navy, navigators generally will count their time as they count it now. I think that navigators will not change the rule now in force, no matter what we adopt in this Conference.

Commander SAMPSON, delegate of the United States. I think, Mr. President and gentlemen, that the change to the adoption of the universal day, beginning at midnight, would be a very decided advantage to navigators. The quantities as now given in the nautical ephemerides are for noon of the meridian for which they are computed, as Washington, Greenwich, &c. It is very evident that every navigator, in making use of the quantities given in the nautical almanac, must find the corresponding time at Greenwich, wherever he may be on the surface of the earth. Consequently, if we suppose that navigators are pretty equally distributed, one half on one side of the earth and one-half on the other side, the Greenwich day for one portion would be the local night for the other.

The usual observations made by navigators at sea consist in a meridian observation of the sun for latitude, and a morning and possibly afternoon observation of the sun near the prime vertical for longitude. Consequently all navigators, when in the vicinity of the initial meridian, might have their day's work occurring in two astronomical days. On the other hand, those navigators who were in the neighborhood of the 180th meridian would have all their work of one day occurring in the same astronomical day. The first would have the advantage of interpolating for short intervals only, while the second would be obliged to interpolate for much larger intervals.

Consequently, on the whole, it would make no difference to navigators whether the quantities given in the nautical almanacs were for noon or midnight of the initial meridian. Another consideration, however, would make it very advantageous to have the quantities given for midnight. That consideration is this: if midnight were chosen, then the universal day would be identical with the nautical almanac day, and navigators would have only ship time and universal time to deal with, while, if the quantities were given for noon they would have astronomical time, in addition to the other two. This consideration I think a very important one.

The PRESIDENT. The question will be on the amendment offered by the delegate of Sweden, Count Lewenhaupt, which has been read.

The vote was then taken, as follows:

States voting in the affirmative: Austria, Italy, Netherlands, Sweden, Switzerland, Turkey.

In the negative: Brazil, Chili, Colombia, Costa Rica, Great Britain, Guatemala, Hawaii, Japan, Liberia, Mexico, Paraguay, Russia, United States, Venezuela.

Abstaining from voting: France, Germany, San Domingo, Spain.

Ayes, 6; noes, 14; abstaining from voting, 4.

The PRESIDENT then announced that the amendment was lost.

The question then recurred on the original resolution offered by the delegate of the United States.

RUSTEM EFFENDI, delegate of Turkey. Mr. President, I have listened with a great deal of interest and attention to the learned arguments bearing upon the proposition under discussion offered by the Hon. Mr. Rutherfurd, the delegate of the United States, for the adoption of a universal hour.

This question is of such high importance, and of such interest to

every one, that I consider it my duty to make a few remarks upon the subject, as I wish to state clearly the position my Government proposes to take in the matter.

I do not pretend to discuss scientifically this subject, which has already been so ably treated by several of the gentlemen present. My task is of a different and inferior order. I merely propose to briefly examine the manner in which the proposition ought to be made, in order that it may be adopted by our respective Governments.

The question of a universal hour is not of equal interest and importance to all. The United States of America, although comparatively a young nation, have done so much in the pursuit of science and scientific investigation that they must have more than a common interest on the subject. The vast expanse of their country, stretching over sixty degrees of longitude, with a difference of time of more than four hours, almost compels them to adopt a universal hour. The thousands of miles of railroad tracks covering this continent, facilitating the intercourse between distant places, necessitate a uniform system to avoid confusion. It was, therefore, natural that the United States and Canada should have taken the lead in proposing such a reform which would likewise benefit other countries, as, for instance, the British Empire, Russia, and Germany. But there are, at the same time, other countries, like France, Spain, Italy, Scandinavia, &c., that may content themselves with a national hour, owing to the small difference in time within their dominion. For them, the adoption of a universal hour would only be of secondary importance, because it would only affect their international relations.

I hope I may be permitted to remind you of the conclusions arrived at by a commission consisting of scientists, railroad and telegraph officials, &c., appointed by the French Government to express their opinion upon this subject. If I am not mistaken, they recommended a universal hour, stating, however, at the same time, that the benefit to be derived from such an hour would be only of secondary importance for their country. The learned delegate from France, Professor Janssen, will probably be kind enough to inform us whether I am right or not.

The few remarks I have made bring me to the point I wanted to consider more specially. I mean that the originators of the pending proposition, and those directly interested in it, should be induced to modify their proposition somewhat if they wish it to be adopted by other countries. In other words, to leave to each country the greatest latitude possible in adopting a universal hour.

With regard to the Ottoman Empire, I must state that it is placed in a somewhat exceptional position in this respect, and is, therefore, obliged to ask for more latitude even than the other countries concerned.

In our country we have two modes of reckoning time: One from noon to noon, or from midnight to midnight, as everywhere else (heure à la franque), the other (heure à la turque) from sundown to sundown. In this latter case the hours count from the moment when the disk of the sun is bisected by the horizon, and we count twice from 0 hours to 12 hours, instead of counting without any interruption from 0 hours to 24 hours. We are all well aware of the inconveniences this system of counting produces, because 0 hours necessarily varies from day to day, for the interval of time between one sunset and the one following is not exactly 24 hours. According to the season the sun will set earlier or later, and our watches and clocks at Constantinople will be at most about three minutes fast or slow from day to day, according to the season.

Reasons of a national and religious character prevent us, however, from abandoning this mode of counting our time. The majority of our population is agricultural, working in the fields, and prefer to count to sunset; besides, the hours for the Moslem prayers are counted from sundown to sundown.

Therefore, it is impossible for us to abandon our old system of time, although in our navy we generally use the customary reckoning or "heure à la franque."

Finally, permit me to state that I am ready to cast my vote in favor of a universal hour, with the precise understanding that the universal hour will have to be limited to international transactions, and that will not interfere with the rules up to now in force in my own country.

Before resuming my seat I wish to thank the president and the members of the Conference for their kind indulgence in having listened to my remarks.

The PRESIDENT. The chair would remind the delegate of Turkey that the following resolution was passed at our last session:

Resolved, That the Conference propose the adoption of a universal day for all purposes for which it may be found convenient, and which shall not interfere with the use of local or other standard time where desirable.

The very difficulty which the delegate of Turkey anticipates was thus carefully provided for in the resolution just read.

Mr. SANDFORD FLEMING, delegate of Great Britain. To my mind it is of very great importance that this resolution should be adoted. I have already given generally my views on this question, and therefore I do not intend to trespass on the attention of the Conference beyond saying a very few words. From what I have already ventured to submit, it will be obvious that I hold that all our usages in respect to the reckoning of time are arbitrary. Of one thing there can be no doubt. There is only one, and there can only be one flow of time, although our inherited usages have given us a chaotic number of arbitrary reckonings of this one conception. There can be no doubt of another matter; the progress of civilization requires a simple and more rational system than we now have. We have, it seems to me, reached a stage when a unification of the infinite number of time-reckonings is demanded.

This unification will be, to a large extent, accomplished if the resolution be adopted, and by adopting it, it seems to me to be in the power of the Conference to confer lasting benefits on the world.

Universal time will in no way interfere with local time. Each separate community may continue the usages of the past in respect to local time, or may accept whatever change the peculiar conditions of each case may call for. But the use of universal time will not necessarily involve a change; it will rather be something added to what all now possess. It will be a boon to those who avail themselves of it.

To the east of the prime meridian all possible local days will be in advance; to the west all possible days will be behind the universal day.

The universal day, as defined by the resolution, will at once be the mean of all possible local days, and the standard to which they will all be related by a certain known interval, that interval being determined by the longitude.

In my judgment the resolution is an exceedingly proper one, and the Conference will act wisely in passing it.

The PRESIDENT. In taking the vote upon the resolution it is requested that the roll be called.

The following states voted in the affirmative: Brazil, Chili, Colombia,

Costa Rica, Great Britain, Guatemala, Hawaii, Japan, Liberia, Mexico, Netherlands, Paraguay, Turkey, United States, Venezuela.

States voting in the negative: Austria-Hungary, Spain.

Abstaining from voting: France, Germany, Italy, Netherlands, San Domingo, Sweden, Switzerland.

Ayes, 15; noes, 2; abstained, 7.

The PRESIDENT then announced that the resolution was passed.

Mr. RUTHERFURD, delegate of the United States. Mr. President, I now present for the consideration of the Conference the following resolution:

Resolved, That the Conference expresses the hope that as soon as may be practicable the astronomical and nautical days will be arranged everywhere to begin at midnight.

Before action is taken upon this resolution, I would make a verbal correction. I think that the word "*mean*" ought to be introduced before the word "*midnight*," and I therefore alter my resolution in that way.

The vote was then taken upon the resolution just offered, and it was carried without division.

The PRESIDENT. The chair begs leave to state that the protocols in French and in English of the first and second sessions of the Conference have been examined, and are now before the Conference for adoption. If any delegate wishes to make any correction in these protocols, he can submit it to the Conference, and, if approved, it can be immediately made.

No objection was raised, and the president put the question to the Conference on the adoption of the protocols of the first and second sessions in French and English, and they were unanimously adopted.

Mr. JANSSEN, delegate of France. Mr. President, we have been directed to present for the approval of the Congress the desire that studies relative to the application of the decimal system to the division of angular space and of time should be resumed in order that this application may be extended to all cases—and they are numerous and important—where it presents real advantages.

I would say that a similar desire upon the same subject was expressed by the Conference at Rome.

You are aware, gentlemen, that at the time of the establishment of the metrical system the decimal division had been extended to the measurement of angular space and of time. Numerous instruments were even made according to the new system. As to time, the reform was introduced too abruptly, and, we might say, without enough discretion, and it came into conflict with old habits and was quickly abandoned; but as to the division of angular space, in which the decimal division presented many advantages, the reform sustained itself much better, and is still used for certain purposes. So the division of the circumference into 400 parts was adopted by Laplace, and we find it constantly employed in the Mécanique Celeste. Delambre and Mechain used, for the measurement of the arc of the meridian from which the meter was derived, repeating circles divided into "*grades*." Finally, in our own time, Colonel Perrier, chief of the geographical division of our Department of War, has used instruments decimally divided, and at the present time logarithmic tables appropriate to that method of division are in course of calculation.

But it is especially when it is a question of making long calculations of angular space that the decimal system presents great advantages. In this respect we find, so to speak, only one opinion expressed by scientists.

The Conference at Rome, which brought together so many astronomers, geodetists, eminent topographers—that is to say, the men most competent and most interested in the question—expressed in respect to it a desire, the high authority of which it is impossible to mistake.

It is, therefore, now evident that the decimal system, which has already done such good service in the measurements of length, volume, and weight, is called upon to render analogous services in the domain of angular dimensions and of time.

I know that this question of the decimal division encounters legitimate doubts, principally as to its application to the measurement of time. It is feared that we want to destroy habits fixed for centuries, and upset established usages.

In this respect, gentlemen, I think that we ought to be fully satisfied. The teachings of the past will be respected. It will be perceived that if we failed at the time of the Revolution, it is because we put forward a reform which was not limited to the domain of science, but which did violence to the habits of daily life. It is necessary to take the question up again, but with due regard to the limits which common sense and experience would prescribe to wise and well-informed men.

I think that the character of the reform would be well defined by saying that it is intended especially to make a new effort towards the application of the decimal system in scientific matters.

But, gentlemen, I have not to discuss here the bearing of the reforms which the study of this question will lead to. It is sufficient for me to show that there is in that direction an indispensable step to be made, and to ask you to express the desire that the question should be studied. I do not think that there is anybody here who would desire to oppose a request which does not in truth commit us to any specific solution of the question, and which appears so opportune at the present time. I would ask the president to be so kind as to submit the following proposition to the Conference:

Resolved, That the Conference expresses the hope that the studies designed to regulate and extend the application of the decimal system to the division of angular space and of time shall be resumed, so as to permit the extension of this application to all cases where it presents real advantages.

The PRESIDENT. The chair is of opinion that the Conference was called for a special and somewhat narrow purpose, and the consideration of the decimal system, proposed by the delegate of France, seems to it foreign to that purpose and beyond the scope of the Conference. The president, however, simply acts for the Conference, and if the Conference shall decide to take the matter up, he will acquiesce, but it strikes the chair that the resolution is out of order.

General STRACHEY, delegate of Great Britain. Sir, I desire to express my personal views on this subject. I should be very happy to join the delegate of France in voting for such a resolution, but I fear that there is a feeling among many of the delegates that it is not within our competence to discuss it. If that is so, I would suggest whether it might not be better that it should not be pressed to a vote. It would be a pity if there should be on the records of the proceedings of this Conference anything in the shape of a vote against the subject-matter of this resolution. I consequently think that if delegates have formed any decided opinion on the subject, they might express their opinion without voting; but I repeat that it would be a great pity if a negative vote should be taken on the subject of the decimal system of dividing the circle and time, particularly as it was received with unanimity in the Conference at Rome.

Professor ADAMS, delegate of Great Britain. Mr. President, I may say that while I agree with General Strachey in thinking that I should not like to vote against the proposition brought forward by our eminent colleague, Mr. Janssen, yet I feel it is somewhat beyond the scope of the subjects which we have to discuss, and, therefore, I should abstain from voting. I quite recognize that, for certain purposes, the decimal division of the circle is very valuable.

The PRESIDENT. Unless the Conference decides to entertain this proposition, the chair suggests that no discussion shall take place. If any member present desires to bring the matter up, he can do so by taking an appeal from the decision just made.

General STRACHEY, delegate of Great Britain. Do I understand, sir, that the subject is dropped?

The PRESIDENT. The chair has decided that the resolution offered by the delegate of France is out of order, and unless a difference of opinion is expressed by the Conference, the subject will be dropped. The chair wishes to treat with the most distinguished deference the delegate of France, because we are all most happy to do honor to him in every way. Does the chair understand that the delegate of France appeals from its decision, and wishes to take the sense of the Conference upon it?

Mr. JANSSEN, delegate of France, replied in the affirmative.

Commodore FRANKLIN, delegate of Colombia. Mr. President, I would like to hear the resolution read again. If it be merely a suggestion to consider the subject of the decimal system, I should like to know it.

The vote was then taken upon the appeal of the delegate of France from the decision of the chair.

States voting in favor of the appeal: Austria-Hungary, Brazil, Chili, France, Italy, Japan, Mexico, Netherlands, San Domingo, Spain, Switzerland, Turkey, Venezuela.

States voting against the appeal: Colombia, Costa Rica, Germany, Great Britain, Guatemala, Hawaii, Liberia, Paraguay, United States.

Abstaining from voting: Russia, Sweden.

Ayes, 13; noes, 9; abstained, 2.

The PRESIDENT. The appeal from the decision of the chair is sustained, and the proposition offered by the delegate of France is now before the Conference. If no delegate wishes to speak upon the resolution, the vote will be taken.

Mr. JANSSEN, delegate of France. Mr. President, before the definitive vote I desire to again call my colleagues' attention to the fact that it is a question here of the much-needed extension of the decimal system, an extension desired by a large number of the highest scientific authorities and of the most distinguished observers. As I said only a moment ago, the Congress at Rome, whose high authority in the matters which have occupied us is acknowledged, was a still higher authority as to astronomy, geodesy, topography; that is to say, in the domain to which our proposition relates. At Rome a wish, similar to that which we ask you to formulate, was expressed. Besides, if we observe that it is a question here only of expressing the desire that studies should be resumed upon the matter in question, is there any one among us who would wish to oppose the liberal proposition which prejudges nothing in the solution of the question, but which will surely lead to important progress? I do not doubt, then, that all our colleagues will desire to unite in a resolution, which by its object and by the manner in which it is expressed, ought, it appears to me, to unite the suffrages of all.

No further remarks were made upon the resolution, and the vote was accordingly taken on the question whether it should be adopted.

States voting the affirmative: Austria-Hungary, Brazil, Chili, Colombia, Costa Rica, France, Great Britain, Hawaii, Italy, Japan, Liberia, Mexico, Netherlands, Paraguay, Russia, San Domingo, Spain, Switzerland, Turkey, United States, Venezuela.

States voting in the negative: None.

Abstained from voting: Germany, Guatemala, Sweden.

Ayes, 21; noes, 0; abstained, 3.

The PRESIDENT. The resolution of the delegate of France is, therefore, adopted.

General STRACHEY, delegate of Great Britain. Sir, before concluding the session to-day, I hope that the delegates will be in a position to listen to the two resolutions which I now desire to propose, and which I think will tend to clear up a good deal of the discussions which we have had. The first of these resolutions is as follows:

The Conference adopts the opinion that, for the purposes of civil life, it will be convenient to reckon time, according to the local civil time at successive meridians distributed round the earth, at time-intervals of either ten minutes, or some integral multiple of ten minutes, from the prime meridian; but that the application of this principle be left to the various nations or communities concerned by it.

This resolution, as it stands, embraces all the practical suggestions which have been made on the subject up to the present time. The only limitation it proposes to put upon the adoption of what may be called local standard time is that the breaks shall be at definite intervals of ten minutes or more.

The second resolution which I propose is a very simple one. It is this:

The arrangements for adopting the universal day in international telegraphy should be left for the consideration of the international telegraph congress.

There has been established by an international arrangement a congress which meets every two years to settle questions of international telegraphy, and I think that the precise manner in which universal time may be adapted to telegraphy would very properly be left to that congress.

Mr. DE STRUVE, delegate of Russia. On behalf of the delegates of Russia, I beg to make the following remarks:

We have already expressed the opinion that the universal time could be properly used for international postal, railway, and telegraphic communications. But it is to be understood that local or any other standard time, which is intimately connected with daily life, will necessarily be used side by side with the universal time.

It has been proposed, in order to establish an easier connection between local and universal time, to accept twenty-four meridians at equal distances of 1 hour or 15°, or to divide the whole circumference of the earth by meridians at distances of 10 minutes of time or $2\frac{1}{2}$°.

This question not yet having been made the subject of special and thorough investigation by the respective Governments, and not having been discussed at the International Conference at Rome, we believe that it would as yet be difficult to express, in regard to Europe, any positive opinion on the practical convenience of the above-mentioned or other possible methods of dividing the globe into equal time-zones.

We would suggest to recommend that the system of counting the hours of the universal day from 0 to 24, which probably will be adopted for the universal day, might also be introduced for counting the local time side by side with the old method of counting the hours of 0 to 12 a. m. and 0 to 12 p. m.

Count LEWENHAUPT, delegate of Sweden. I have had the honor to transmit to the members of the Conference a *résumé* of a report on this subject made by Professor Gyldén, an eminent Swedish astronomer, whose name, no doubt, is familiar to many of the delegates. The system proposed by Mr. Gyldén is similar to the one now proposed by the delegate for Great Britain. The only difference is that Mr. Gyldén, in explaining the system, recommends the adoption of equidistant meridians, separated by intervals of $2\frac{1}{2}^{\circ}$, or 10 minutes of time, while the proposition of the delegate for Great Britain is so worded that this distance may be greater than 10 minutes. This difference is, however, only a question of detail. The basis of Mr. Gyldén's system is that time meridians should be separated from the standard initial meridian by either 10 or some integral multiple of 10 minutes. Therefore, I shall, with pleasure, vote for the resolution of the delegate from Great Britain.

I beg only permission of the Conference to insert Mr. Gyldén's report as part of my remarks.

RÉSUMÉ OF A REPORT READ BEFORE THE SWEDISH GEOGRAPHICAL SOCIETY BY HUGO GYLDÉN, PROFESSOR OF ASTRONOMY AND MEMBER OF THE ACADEMY OF SCIENCES IN STOCKHOLM, CONCERNING THE USE OF EQUIDISTANT MERIDIANS FOR THE FIXATION OF THE HOUR.

If we suppose the meridian passing through the observatory of Greenwich extended round the globe, this grand circle will cut the equator, at 180° from Greenwich, at some place a little east of New Zealand. This meridian falls almost entirely in the ocean, and cuts, in any case, not more than a few small islands in the Pacific. If we suppose, further, another great circle at 90° from the meridian of Greenwich, the western half touches very nearly New Orleans, and the eastern half passes a few minutes from Calcutta. If, now, the hour is fixed according to these four meridians, we have four cardinal times—one European, one American, one Asiatic, and one Oceanic.

It will, however, be necessary to fix much more than one civil time for Europe. Therefore I suppose for Europe a whole system of meridians, which, however, ought not to be closer together than $2\frac{1}{2}^{\circ}$. The difference of time between these meridians is then only 10 minutes, which, in general, can be considered as an insignificant difference between the civil and the true solar time. The starting point of this system is the meridian of Greenwich. To the west the system ought to extend 30 minutes; to the east $2\frac{1}{2}$ hours, or to a meridian passing near Moscow.

I suppose as time zero the meridian of Greenwich The next meridian to the east is meridian 1. This meridian will not pass far from the Observatory of Paris, because the difference between this meridian 1 and the meridian of Paris is only 40 seconds, an insignificant difference in civil life. The meridian 1 can be called the meridian of Paris, or French meridian.

The second meridian (to the east of Greenwich) does not touch Utrecht, but will pass so close that the time of this city could, without the least inconvenience, be regulated as if the difference of time between Greenwich and Utrecht were exactly 20 minutes. The second meridian would also pass almost as close to Amsterdam (22′), and would not be far from Marseilles (1′ 29″). In the vicinity of the third meridian we have, first, Bern (16″); next, a little further, Turin (42″). The fourth meridian is close to Hamburg, Altona, and Gottingen (respectively 6″ and 14″). Not far from the same meridian is Christiania, although at a distance of a little over 2′. The fifth meridian passes also close to three large cities—Rome (5″), Leipsic (26″), and Copenhagen (20″).

The sixth meridian does not touch any city of importance, but it coincides very nearly with the meridian adopted for the normal civil time in Sweden; the difference amounts only to 15″.

The seventh meridian touches the little town of Brieg, in the vicinity of Breslau, and Königsberg is situated 2′ from the eighth. The ninth meridian passes less than 1′ to the west of Abo, and is situated at a distance of only a few seconds from Mistra, a town in Greece. The tenth meridian almost touches Helsingfors, in Finland. As regards the eleventh meridian, I have not been able to find any locality of importance exactly so situated that it merits a place in this list, but I can, however, mention the cities of Minsk and Jassy. The twelfth meridian is situated 1′ 14″ to the west of the Academy of Sciences, in St. Petersburg, and the distance from Kiew is about the same. It is not necessary to continue the enumeration of the other meridians to the

east by intervals of 10′, but I will mention that Moscow is situated $2^h\ 30^m\ 17^s$ to the east of Greenwich, and in consequence the system would be convenient with regard to this city.

If we pass to the west of Greenwich, we will find that the first meridian west touches the little town of Almeria, in the south of Spain, which country extends to equal distances on both sides of this meridian, east and west, and the situation of Portugal is the same with regard to the third meridian west.

Then, in all the towns and localities given above, of which the greater part are of some importance, the local time coincides so closely with times differing from the Greenwich time, by whole multiples of 10′, that there is no reason to fear any real inconvenience if these times were taken to regulate local reckonings. If the different countries in Europe should decide to adopt the system which I have explained, the following system of normal times would, perhaps, be found convenient:

East of Greenwich:
1st meridian: France.
2d meridian: Holland and Belgium.
3d meridian: Switzerland.
4th meridian: Norway (and Western Germany).
5th meridian: Denmark, Germany, and Italy.
6th meridian: Sweden and Austria.
7th meridian: Eastern Germany.
8th meridian: Hungary.
9th meridian: Poland and Greece.
10th meridian: Finland, Roumania, and Bulgaria.
11th meridian: European Turkey.
12th meridian: Western Russia.

West of Greenwich:
1st meridian: Spain.
3d meridian: Portugal.

It is, however, not at all necessary that each country should adopt a single civil time for the whole of its territory. If several normal times should be adopted, it is still possible to use the system, provided only the several times differ from Greenwich time by 10′, 20′, &c.; but it would be necessary that the clocks should indicate the times adopted with great precision, and that the difference did not amount to even a few seconds, because otherwise the advantages of the adoption of the system would be materially reduced.

This circumstance, that it is possible for each country to adopt the system, and at the same time to maintain a certain independence with regard to the adoption of the most convenient normal times, is of considerable importance with regard to the possibility of introducing a system of this kind. In fact, it is possible to arrive at the application of the system in such a way that the transition would hardly be observed by the great majority of the population. As regards railroads and telegraphs, the advantages would be the same as if the local times were everywhere identical, because it is easy to remember the multiple of 10′ which ought to be added to the time of a given country for translation into the time of another country. The difference of time between Sweden and Denmark would, for instance, be 10′—a circumstance which everybody would soon learn to remember. A traveler leaving Sweden would then know that his watch, if correct, shows exactly 10′ more than the clocks of the Danish railroad stations, and if he continued his voyage to Paris he would know that the clocks of Paris are exactly 50′ behind the clocks in Sweden.

I have tried to explain the advantages of this system for the countries in Europe. I am not able to judge if similar systems can be considered necessary in America and Asia. It is possible that North America could be satisfied with one single normal time, which, if America connects this time with the European system, ought to be fixed exactly 6 hours behind Greenwich. While starting from this normal meridian it is possible to establish a more or less elaborate system of equidistant times analogous to the system which has been proposed for Europe. The same can be said of the civil times of Asia, which ought to be connected with a normal time 6 hours in advance of the time of Greenwich.

Africa ought to belong to the European system. The French civil time could be adopted for Algeria and Tunis; the time of Denmark, Germany, and Italy for Tripoli; for Egypt the time of Russia; the Spanish time for Morocco; at the mouth of the Congo, where no doubt sooner or later an important center of civilization will rise, the meridian of Sweden and Austria could be used; the meridian of Hungary could be adopted for the Cape of Good Hope.

It will not be possible to connect South America and Australia with any of the four cardinal times mentioned, but some other combination, into which it is not necessary to enter on this occasion, can easily be found.

The PRESIDENT. If the chair hears no objection, the pamphlet referred to by the delegate of Sweden will be printed as proposed.

Mr. LEFAIVRE, delegate of France. Mr. President, I move that the Conference adjourn until Wednesday, at 1 o'clock p. m.

The motion was put and agreed to, and the Conference thereupon adjourned, at 4.30 p. m., until Wednesday, the 22d instant, at 1 o'clock p. m.

VII.

SESSION OF OCTOBER 22, 1884.

The Conference met, pursuant to adjournment, in the diplomatic hall of the Department of State, at 1 o'clock p. m.

Present:

Austria-Hungary: Baron Ignatz von Schæffer.
Brazil: Dr. Luiz Cruls.
Chili: Mr. F. V. Gormas and Mr. A. B. Tupper.
Colombia: Commodore S. R. Franklin.
Costa Rica: Mr. Juan Francisco Echeverria.
France: Mr. A. Lefaivre, Mr. Janssen.
Germany: Baron H. von Alvensleben, Mr. Hinckeldeyn.
Great Britain: Sir F. J. O. Evans, Prof. J. C. Adams, Lieutenant-General Strachey, Mr. Sandford Fleming.
Guatemala: Mr. Miles Rock.
Hawaii: Hon. W. D. Alexander, Hon. Luther Aholo.
Italy: Count Albert de Foresta.
Japan: Professor Kikuchi.
Liberia: Mr. Wm. Coppinger.
Mexico: Mr. Leandro Fernandez, Mr. Angel Anguiano.
Netherlands: Mr. G. de Weckherlin.
Paraguay: Capt. John Stewart.
Russia: Mr. C. de Struve, Major-General Stebnitzki, Mr. J. de Kologrivoff.
San Domingo: Mr. de J. Galvan.
Spain: Mr. Juan Valeri, Mr. Emilio Ruiz del Arbol, and Mr. Juan Pastorin.
Sweden: Count Carl Lewenhaupt.
Switzerland: Col. Emile Frey.
Turkey: Rustem Effendi.
United States: Rear-Admiral C. R. P. Rodgers, Mr. Lewis M. Rutherfurd, Mr. W. F. Allen, Commander W. T. Sampson, Professor Cleveland Abbe.
Venezuela: Dr. A. M. Soteldo.

Absent:

Denmark: Mr. C. S. A. de Bille.
Salvador: Mr. Antonio Batres.

The PRESIDENT. The first business before the Conference to-day is the resolutions offered by the delegate of Great Britain, General Strachey; but before we proceed, the delegate of San Domingo, Mr. Galvan, asks permission, as a matter of privilege, to read a communication to the Conference.

Mr. GALVAN, the delegate of San Domingo. Before the sessions of the Conference come to a close, I feel compelled to make a declaration

which will be a tribute to the illustrious scientists who have directed the decisions of the majority of the Conference, and at the same time a reservation of future freedom of action to the country which I have the honor to represent.

The negative vote of San Domingo on the principal question was entirely in consequence of the proposal by the delegates of France of a neutral international meridian, which was rejected by the Conference.

San Domingo, which had no part in the various important interests connected with the meridian of Greenwich, was bound to regard equity alone on the occurrence of the disagreement produced by the proposal of the delegates of France, a nation renowned for being one of the first in intellectual progress.

At the last session I was glad that another proposal of the delegates of France was accepted almost unanimously by the Conference. That fact should be considered as a good omen of a more complete and unanimous agreement at some future time in behalf of the general interest of science.

That day will be saluted with a cordial *hosanna* by the Republic of San Domingo, which is always ready freely to give its assent to the progress of civilization.

The PRESIDENT. The resolutions offered by the delegate of Great Britain, General Strachey, are now before the Conference and will be read.

The resolutions were then read, as follows:

1. The Conference adopts the opinion that, for the purposes of civil life, it will be convenient to reckon time according to the local civil time at successive meridians distributed round the earth, at time-intervals of either ten minutes, or some integral multiple of ten minutes, from the prime meridian; but that the application of this principle be left to the various nations or communities concerned by it.

2. The arrangements for the use of the universal day in international telegraphy should be left for the consideration of the International Telegraph Congress.

General STRACHEY, delegate of Great Britain. In consequence of the opinions I have heard expressed regarding the resolutions which I brought forward at our last meeting, I feel constrained to say that I am not disposed to ask the Congress to proceed to a vote upon them. I find that, although I had reason to think that those resolutions in substance, that is, in their main features, would be acceptable, still there is extreme difficulty in finding precise expressions that shall meet the views of everybody, and there are divisions of opinion as to the exact manner in which these resolutions should be modified.

My object in bringing forward the resolutions was mainly to obtain a decided expression of opinion on the part of the Congress that the method of counting local time, so as to harmonize as far as possible with universal time, should be left for settlement locally, and that, at the utmost, all the Congress could do would be to suggest some general principle, such as that embodied in my resolution. There was, of course, never any intention of employing the universal day so as to interfere with the use of local standard time, and, as I shall no doubt elicit a further clear expression of opinion on the part of the delegates that there is no intention of bringing about this interference, I will now, with the permission of the Conference, withdraw the resolutions.

Mr. RUTHERFURD, delegate of the United States. Mr. Peesident, I think that all of us appreciate the desire which moved the delegate of Great Britain to present these resolutions. There is a wish on his part that we should not seem in any way by our action here to interfere with the convenience of the world in the use of its present civil time or any

other time which it may be found convenient to adopt, while he recognizes that some of the proposals made as to local time are such as could not be objected to. Still, I cannot refrain from expressing my satisfaction that he has come to the conclusion that these resolutions are not necessary.

I think the whole question is covered by the resolutions already adopted by this Congress—that our universal day is for those purposes only for which it may be found convenient, and that it is not to interfere in any way with the use of civil or other standard time where that may be found convenient. This seems to me to be so fully embodied in our resolutions that it is unnecessary to enunciate again in a negative form the same idea, and I therefore express my satisfaction that the resolutions are withdrawn.

Mr. SANDFORD FLEMING, delegate of Great Britain. Mr. President, I have a few words bearing upon the subject before the Conference. which I wish to express before any action is taken.

The PRESIDENT. There will be no subject before the Congress if the resolutions of General Strachey are withdrawn, and the chair understands that the object of General Strachey in withdrawing these resolutions was to avoid a discussion upon a subject that could hardly lead to any satisfactory conclusion. If, however, Mr. Fleming desires to address the Conference, he will be at liberty to do so.

Mr. FLEMING, delegate of Great Britain. I do not wish to intrude any new matter upon the Conference. What I had to say had a bearing upon the subject; but, if the resolutions are withdrawn and the Conference desires to end the matter, I shall not insist upon speaking.

No objection being made, the resolutions offered by General Strachey at the last session of the Conference were then withdrawn.

Count LEWENHAUPT, delegate for Sweden, then proposed that the resolutions passed by the Conference should be formally recorded in a final act, stating the votes on each resolution that was adopted.

The Conference took a recess, in order to allow the delegates to examine the draft of the final act.

After the recess the final act was unanimously adopted, as follows:

FINAL ACT.

The President of the United States of America, in pursuance of a special provision of Congress, having extended to the Governments of all nations in diplomatic relations with his own, an invitation to send delegates to meet delegates from the United States in the city of Washington, on the 1st of October, 1884, for the purpose of discussing, and, if possible, fixing upon a meridian proper to be employed as a common zero of longitude and standard of time-reckoning throughout the whole world, this International Meridian Conference assembled at the time and place designated; and, after careful and patient discussion, has passed the following resolutions:

I.

That it is the opinion of this Congress that it is desirable to adopt a single prime meridian for all nations, in place of the multiplicity of initial meridians which now exist.

This resolution was unanimously adopted.

II.

That the Conference proposes to the Governments here represented the adoption of the meridian passing through the center of the transit instrument at the Observatory of Greenwich as the initial meridian for longitude.

The above resolution was adopted by the following vote:

In the affirmative: Austria-Hungary, Chili, Colombia, Costa Rica, Germany, Great Britain, Guatemala, Hawaii, Italy, Japan, Liberia, Mexico, Netherlands, Paraguay, Russia, Salvador, Spain, Sweden, Switzerland, Turkey, United States, Venezuela.

In the negative: San Domingo.

Abstaining from voting: Brazil, France.

Ayes, 22; noes, 1; abstaining, 2.

III.

That from this meridian longitude shall be counted in two directions up to 180 degrees, east longitude being plus and west longitude minus.

This resolution was adopted by the following vote:

In the affirmative: Chili, Colombia, Costa Rica, Great Britain, Guatemala, Hawaii, Japan, Liberia, Mexico, Paraguay, Russia, Salvador, United States, Venezuela.

In the negative: Italy, Netherlands, Spain, Sweden, Switzerland.

Abstaining from voting: Austria-Hungary, Brazil, France, Germany, San Domingo, Turkey.

Ayes, 14; noes, 5; abstaining, 6.

IV.

That the Conference proposes the adoption of a universal day for all purposes for which it may be found convenient, and which shall not interfere with the use of local or other standard time where desirable.

This resolution was adopted by the following vote:

In the affirmative: Austria-Hungary, Brazil, Chili, Colombia, Costa Rica, France, Great Britain, Guatemala, Hawaii, Italy, Japan, Liberia, Mexico, Netherlands, Paraguay, Russia, Salvador, Spain, Sweden, Switzerland, Turkey, United States, Venezuela.

Abstaining from voting: Germany, San Domingo.

Ayes, 23; abstaining, 2.

V.

That this universal day is to be a mean solar day; is to begin for all the world at the moment of mean midnight of the initial meridian, coinciding with the beginning of the civil day and date of that meridian; and is to be counted from zero up to twenty-four hours.

This resolution was adopted by the following vote:

In the affirmative: Brazil, Chili, Colombia, Costa Rica, Great Britain, Guatemala, Hawaii, Japan, Liberia, Mexico, Paraguay, Russia, Turkey, United States, Venezuela.

In the negative: Austria-Hungary, Spain.

Abstaining from voting: France, Germany, Italy, Netherlands, San Domingo, Sweden, Switzerland.

Ayes, 15; noes, 2; abstaining, 7.

VI.

That the Conference expresses the hope that as soon as may be practicable the astronomical and nautical days will be arranged everywhere to begin at mean midnight.

This resolution was carried without division.

VII.

That the Conference expresses the hope that the technical studies designed to regulate and extend the application of the decimal system to the division of angular space and of time shall be resumed, so as to permit the extension of this application to all cases in which it presents real advantages.

The motion was adopted by the following vote:

In the affirmative: Austria-Hungary, Brazil, Chili, Colombia, Costa Rica, France, Great Britain, Hawaii, Italy, Japan, Liberia, Mexico, Netherlands, Paraguay, Russia, San Domingo, Spain, Switzerland, Turkey, United States, Venezuela.

Abstaining from voting: Germany, Guatemala, Sweden.

Ayes, 21; abstaining, 3.

Done at Washington, the 22d of October, 1884.

C. R. P. RODGERS,
President.

R. STRACHEY,
J. JANSSEN,
L. CRULS,
Secretaries.

The following resolution was then adopted unanimously:

That a copy of the resolutions passed by this Conference shall be communicated to the Government of the United States of America, at whose instance and within whose territory the Conference has been convened.

Mr. RUTHERFURD, delegate of the United States, then presented the following resolution:

Resolved, That the Conference adjourn, to meet upon the call of the president, for the purpose of verifying the protocols.

This resolution was then unanimously carried, and the Conference adjourned at half past 3, to meet upon the call of the president.

VIII.

SESSION OF NOVEMBER 1, 1884.

The Conference met at the call of the president for the approval or the protocols, as arranged at the last meeting, in the diplomatic hall of the Department of State, at 1 o'clock p. m.

The PRESIDENT, having called the Conference to order, said: The protocols, in French and English, having been examined by the secretaries of the Conference, have been submitted to all of the delegates for perusal. If any delegate should desire to make any observations on them the opportunity is now given for his doing so.

RUSTEM EFFENDI, delegate of Turkey, stated that he desired to change his vote on the fifth resolution of the final act, providing for the commencement of the universal day, from the affirmative to the negative.

No objection being made, the change was ordered to be made.

The PRESIDENT then said: No further observations having been made on the protocols, they will now be signed by the secretaries and the president.

Mr. DE STRUVE, delegate of Russia. Before the Conference terminates I beg to express, in the name of my colleagues, our sincere grati-

tude for the hospitality extended to the Conference by the Government of the United States, and I beg to express our heartiest thanks to you, Mr. President, for the able and impartial manner in which you have presided over our deliberations. When we elected you, we unanimously elected the first delegate of the United States. If we had to begin again, the personal feelings of all the delegates would supply powerful additional reasons for making the election equally unanimous.

Mr. DE STRUVE'S observation met with the unanimous approval of the delegates.

The PRESIDENT. Gentlemen, I am greatly honored by the kind expression of your good feeling towards me as the president of this Conference, and I thank you very heartily for it. The duty assigned to us all has not been free from difficulty, but our meetings and discussions have been characterized by great courtesy and kindness and by a conciliatory spirit.

With patience and devotion the delegates to this Congress have sought to discharge the trust committed to them, and, as your chairman, I beg you to receive my most cordial thanks for the courteous consideration I have received at your hands. The President of the United States and the Secretary of State desire me to renew to you their thanks for your presence here, and their best wishes for your safe and happy return each to his own home.

I shall esteem myself very happy hereafter whenever I shall have the good fortune to meet any of my colleagues of the International Meridian Conference.

Mr. RUTHERFURD, delegate of the United States. Mr. President and gentlemen, I am sure that you will all unite with me in passing the resolution which I now propose to read:

Resolved, That the thanks of the Conference be presented to the secretaries for the able manner in which they have discharged their arduous duties.

The resolution was unanimously adopted.

General STRACHEY, delegate of Great Britain. I wish, sir, as one of the secretaries, to express my thanks for the manner in which my labors have been esteemed by the delegates present. All that I can say on the subject is that however troublesome the duties of the secretaries have been, I have not the least doubt that anybody else named instead of myself would equally have bestowed his best attention on the discharge of those duties.

Mr. JANSSEN, delegate of France, then said: Before the dissolution of the Conference, Mr. Cruls and I desire specially to thank our colleagues for the honor they have done us by intrusting to us the revision of the French version of the protocols. In order that we might fully respond to that honor, we have examined with all possible care the French translation of the remarks of our colleagues. Our only regret is that, in consequence of the desire of several of them to quit Washington, we have been obliged to leave portions of the translations, particularly of the last protocols, much in the state in which we received them from the official translators, not having had the time to correct these translations as we would have desired.

Upon motion of Mr. JANSSEN, delegate of France, the Conference passed a vote of thanks to the delegate of Turkey for the aid he has rendered the secretaries in the revision of the protocols.

The PRESIDENT then said: Before our final adjournment I desire to express a very high appreciation of the ability, fidelity, and zeal with which Mr. W. F. Peddrick, the secretary attached by the Department

of State to this Conference, has performed his difficult duties, and to thank him for his services.

The Conference expressed its cordial assent to these observations.

The PRESIDENT then declared that the business of the Conference having been concluded, it would adjourn *sine die*.

C. R. P. RODGERS,
President.
R. STRACHEY,
J. JANSSEN,
L. CRULS,
Secretaries.

ANNEX I.

AN ACT to authorize the President of the United States to call an International Conference to fix on and recommend for universal adoption a common prime meridian, to be used in the reckoning of longitude and in the regulation of time throughout the world.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the President of the United States be authorized and requested to extend to the governments of all nations in diplomatic relations with our own an invitation to appoint delegates to meet delegates from the United States in the city of Washington, at such time as he may see fit to designate, for the purpose of fixing upon a meridian proper to be employed as a common zero of longitude and standard of time-reckoning throughout the globe, and that the President be authorized to appoint delegates, not exceeding three in number, to represent the United States in such International Conference.

Approved August 3, 1882.

ANNEX II.

AN ACT making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and eighty-five, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and the same are hereby, appropriated for the objects hereinafter expressed for the fiscal year ending June thirtieth, eighteen hundred and eighty-five, namely:

Under the State Department:

For expenses of the International Conference for fixing a common zero of longitude and standard of time-reckoning, including cost of printing and translations, to be expended under the direction of the Secretary of State, five thousand dollars; and the President is hereby authorized to appoint two delegates to represent the United States at said International Conference, in addition to the number authorized by the act approved August third, eighteen hundred and eighty-two, and who shall serve without compensation.

Approved July 7, 1881.

ANNEX III.

[Circular.]

DEPARTMENT OF STATE,
Washington, October 23, 1882.

SIR: On the 3d of August last the President approved an act of Congress in the following words:

"*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That the President of the United States be authorized and requested to extend to the governments of all nations in diplomatic relations with our own an invitation to appoint delegates to meet delegates from the United States in the city of Washington, at such time as he may see fit to designate, for the purpose of fixing upon a meridian proper to be employed as a common zero of longitude and

standard of time-reckoning throughout the globe, and that the President be authorized to appoint delegates, not exceeding three in number, to represent the United States in such international conference."

It may be well to state that, in the absence of a common and accepted standard for the computation of time for other than astronomical purposes, embarrassments are experienced in the ordinary affairs of modern commerce; that this embarrassment is especially felt since the extension of telegraphic and railway communications has joined States and continents possessing independent and widely separated meridional standards of time; that the subject of a common meridian has been for several years past discussed in this country and in Europe by commercial and scientific bodies, and the need of a general agreement upon a single standard recognized; and that, in recent European conferences especially, favor was shown to the suggestion that, as the United States possesses the greatest longitudinal extension of any country traversed by railway and telegraph lines, the initiatory measures for holding an international convention to consider so important a subject should be taken by this Government.

The President, while convinced of the good to flow eventually from the adoption of a common time unit, applicable throughout the globe, thinks, however, that the effort now to be made should be to reach by consultation a conclusion as to the advisability of assembling an International Congress with the object of finally adopting a common meridian. He therefore abstains from extending an invitation for a meeting at an assigned day, until he has ascertained the views of the leading Governments of the world as to whether such International Conference is deemed desirable.

I am accordingly directed by the President to request you to bring the matter to the attention of the Government of ——, through the Minister of Foreign affairs, with a view to learning whether its appreciation of the benefits to accrue to the intimate intercourse of civilized peoples from the consideration and adoption of the suggested common standard of time so far coincides with that of this Government as to lead it to accept an invitation to participate in an International Conference at a date to be designated in the near future.

You may leave a copy of this instruction with the Minister for Foreign Affairs, and request the views of his Government thereon, at as early a day as may be conveniently practicable.

I am, sir, your obedient servant,

FRED'K T. FRELINGHUYSEN.

ANNEX IV.

[Circular.]

DEPARTMENT OF STATE,
Washington, December 1, 1884.

SIR: By a circular instruction of October 23, 1882, you were made acquainted with (the language of) an act of Congress, approved August 3, 1882, authorizing and requesting the President to extend to other Governments an invitation to appoint delegates to meet in the city of Washington for the purpose of fixing upon a meridian proper to be employed as a common zero of longitude and standard of time-reckoning throughout the world; and you were instructed to bring the matter to the attention of the Government to which you are accredited and to inform it that the President deemed it advisable to abstain from the issuance of the formal invitation contemplated, until through preliminary consultation the views of the leading Governments of the world as to the desirability of holding such an International Conference could be ascertained.

In the year that has since elapsed this Government has received from most of those in diplomatic relations with the United States the approval of the project, while many have in terms signified their acceptance and even named their delegates.

Besides this generally favorable reception of the suggestion so put forth, interest in the proposed reform has been shown by the Geographical Conference held at Rome in October last, which very decisively expressed its opinion in favor of the adoption of the meridian of Greenwich as the common zero of time longitude, and adjourned, leaving the discussion and final adoption of this or other equivalent unit, and the framing of practical rules for such adoption, to the International Conference to be held at Washington.

The President therefore thinks the time has come to call the Convention referred to in my instruction of October 23, 1882. I am accordingly directed by the President to instruct you to tender to the Government of ——, through its Minister for Foreign

Affairs, an invitation to be represented by one or more delegates (not exceeding three) to meet delegates from the United States and other nations in an International Conference to be held in the city of Washington on the first day of October next, 1884, for the purpose of discussing and, if possible, fixing upon a meridian proper to be employed as a common zero of longitude and standard of time-reckoning throughout the globe.

You will seek the earliest convenient occasion to bring this invitation to the attention of the Minister of Foreign Affairs of ——— by handing him a copy hereof and requesting that the answer of his Government may be made known to you.

I am, sir, your obedient servant,

FRED'K T. FRELINGHUYSEN.

CONFÉRENCE INTERNATIONALE

TENUE A WASHINGTON

POUR L'ADOPTION D'UN

PREMIER MÉRIDIEN UNIQUE

ET D'UNE

HEURE UNIVERSELLE.

OCTOBRE 1884.

PROCÈS-VERBAUX DES SÉANCES.

CONFÉRENCE INTERNATIONALE

POUR L'ADOPTION D'UN

PREMIER MÉRIDIEN UNIQUE TENUE A LA VILLE DE WASHINGTON.

Protocole I.

SÉANCE DU 1ER OCTOBRE 1884.

Les délégués à la Conférence internationale pour le choix d'un premier méridien unique, qui s'étaient réunis à Washington sur l'invitation qui avait été adressée par le Gouvernement des États-Unis à toutes les nations avec lesquelles il avait des relations diplomatiques, pour faire choix d'un méridien initial unique et pour l'introduction d'une heure universelle, ont tenu leur première séance aujourd'hui, le premier octobre 1884, dans la salle diplomatique du Département d'État.

Étaient présents, en qualité de délégués de leurs Gouvernements respectifs:

Pour l'Allemagne: M. le Baron H. von Alvensleben, envoyé extraordinaire et ministre plénipotentiaire.

Pour l'Autriche-Hongrie: M. le Baron Ignatz von Schæffer, envoyé extraordinaire et ministre plénipotentiaire.

Pour le Brésil: M. le Dr. Luiz Cruls, directeur de l'Observatoire impérial de Rio de Janeiro.

Pour la Colombie: M. le Commodore S. R. Franklin, U. S. N., directeur de l'Observatoire naval des États-Unis.

Pour Costa-Rica: M. Juan Francisco Echeverria, ingénieur civil.

Pour l'Espagne: M. Juan Valera, envoyé extraordinaire et ministre plénipotentiaire; M. Emilio Ruiz del Arbol, attaché naval de la légation espagnole; M. Juan Pastorin, officier de marine.

Pour les États-Unis: M. le Contre-Amiral C. R. P. Rodgers, U. S. N.; M. Lewis M. Rutherfurd; M. W. F. Allen, secrétaire des conférences des chemins de fer; M. le Commandant W. T. Sampson, U. S. N.; M. le Professeur Cleveland Abbe, U. S. Signal Office.

Pour la France: M. A. Lefaivre, ministre plénipotentiaire et consul-général; M. Janssen, de l'Institut, directeur de l'Observatoire d'astronomie physique de Paris.

Pour la Grande-Bretagne: Sir F. J. O. Evans, capitaine de vaisseau de la Marine royale; M. J. C. Adams, professeur et directeur de l'Observatoire de Cambridge; M. le Général Strachey, membre du Conseil des Indes; M. Sandford Fleming, représentant la Puissance du Canada.

Pour le Guatémala: M. Miles Rock, ingénieur-en-chef de la Commission pour la fixation des frontières.

Pour Hawaïi: Honorable W. D. Alexander, géomètre-en-chef du Royaume Hawaïïen; Honorable Luther Aholo, conseiller intime de Sa Majesté Hawaiienne.

Pour l'Italie: M. le Comte Albert de Foresta, premier secrétaire de la légation de Sa Majesté le Roi d'Italie.

Pour le Japon: M. le Professeur Kikuchi, doyen du département scientifique de l'Université de Tokio, Japon.

Pour le Mexique: M. Leandro Fernandez, ingénieur-géographe; M. Angel Anguiano, directeur de l'Observatoire astronomique national du Mexique.

Pour le Paraguay: M. le Captaine John Stewart, consul-général.

Pour la Russie: M. C. de Struve, envoyé extraordinaire et ministre plénipotentiaire; M. J. Stebnitzki, major-général de l'état-major impérial russe; M. J. de Kologrivoff, conseiller d'état actuel.

Pour Saint-Domingue: M. M. de J. Galvan, envoyé extraordinaire et ministre plénipotentiaire.

Pour Salvador: M. Antonio Batres, envoyé extraordinaire et ministre plénipotentiaire.

Pour la Suède: M. le Comte Carl Lewenhaupt, envoyé extraordinaire et ministre plénipotentiaire.

Pour la Suisse: M. le Colonel Émile Frey, envoyé extraordinaire et ministre plénipotentiaire.

Pour le Vénézuéla: Señor Dr. A. M. Soteldo, chargé d'affaires.

Ne sont pas présents, messieurs les délégués:

Pour l'Allemagne: M. Hinckeldeyn, attaché à la légation impériale allemande.

Pour le Chili: M. Francisco Vidal Gormas, directeur du bureau d'hydrographie; M. Alvaro Bianchi Tupper, adjoint.

Pour le Danemark: M. Carl Stéen Andersen de Bille, ministre résident et consul-général.

Pour la Libérie: M. W. Coppinger, consul-général.

Pour les Pays-Bas: M. G. de Weckherlin, envoyé extraordinaire et ministre plénipotentiaire.

Pour la Turquie: M. Rustem-Effendi, secrétaire de la légation.

MM. les délégués ont été présentés à M. le Secrétaire d'État des États-Unis, l'Honorable Frederick T. Frelinghuysen, dans son bureau, à midi. Celui-ci a adressé à l'assemblée l'allocution suivante:

MESSIEURS: C'est avec plaisir que je souhaite, au nom du Président des États-Unis, la bienvenue à ce Congrès, où la plupart des nations du globe sont représentées. Vous vous êtes réunis pour considérer et discuter la question importante d'un premier méridien pour toutes les nations. C'est à vous de donner un résultat définitif aux travaux préparatoires d'autres associations savantes et de congrès spéciaux et de rendre ces travaux utiles au monde entier.

Souhaitant une pleine réussite à vos délibérations si importantes, et ne doutant pas que vous n'arriviez à un résultat satisfaisant pour le monde civilisé, je prends la liberté, avant de vous quitter, de nommer M. le comte Lewenhaupt en qualité de président temporaire du Congrès.

Le Département d'État se fera un plaisir de faire tout ce qui dépendra de lui pour faciliter les travaux du Congrès et pour lui en assurer le succès.

Par un vote unanime de la Conférence, le délégué de Suède, M. le Comte Lewenhaupt, est appelé à la présidence temporaire, et dit que pour obtenir une organisation permanente, il fallait procéder à l'élection d'un président, et qu'il avait l'honneur de proposer comme tel M. l'Amiral C. R. P. Rodgers, de la légation des États-Unis d'Amérique.

La Conférence accepte à l'unanimité cette proposition, et M. l'Amiral Rodgers entre en fonctions comme Président de la Conférence, et prononce le discours suivant:

MESSIEURS: Je désire avant tout vous remercier du très grand honneur que vous m'avez fait en m'appelant, en ma qualité de membre de la députation des États-Unis, à présider à ce Congrès. Je vois réunis, comme représentants de pays fort éloignés les uns des autres, des délégués renommés par leurs connaissances dans la diplomatie et la science, cherchant à créer un nouvel accord parmi les nations en faisant choix d'un premier méridien unique, et en introduisant une heure universelle. Nous aurons assurément lieu de nous féliciter si, rejetant nos préférences et nos penchants nationaux, et ne cherchant que le bien du genre humain, nous parvenons à fournir à la science et au commerce un premier méridien unique qui soit acceptable pour tous les pays, et dont l'adoption soit accompagnée du moins d'inconvénients possible.

Voulant aider de tout son pouvoir à l'accomplissement de ce projet, le Gouvernement des États-Unis a invité tous les Gouvernements avec lesquels il a des relations diplomatiques, à envoyer des délégués à un Congrès qui se réunit aujourd'hui à Washington pour discuter la question que je viens d'indiquer. Cette invitation a été accueillie avec bienveillance, et nous voici réunis pour nous acquitter de l'agréable devoir que nous ont confié nos Gouvernements respectifs.

Toute vaste qu'est l'étendue des États-Unis, puisqu'ils comprennent cent degrés de longitude, depuis 66° 52′ à l'ouest de Greenwich jusqu'à 166° 13′ à notre extrême limite dans l'Alaska, abstraction faite des Iles Aléoutiennes; traversés comme ils le sont par des chemins de fer et des lignes télégraphiques, et parsemés d'observatoires; toutes longues que soient leurs côtes, dont l'étendue est de plus de douze mille milles; et malgré toute l'importance de son commerce extérieur et intérieur, les délégués des États-Unis au sein de ce Congrès ne veulent point insister pour qu'on choisisse un premier méridien dans les limites de leur territoire.

Dans ma profession de marin, l'embarras occasionné par les nombreux premiers méridiens qui sont en usage actuellement est très frappant, et dans la communication importante de longitudes entre des navires qui se rencontrent en mer, laquelle se fait souvent à la hâte et difficilement, et ne peut se faire parfois qu'au moyen de chiffres écrits sur un tableau noir, il y a beaucoup de confusion, et il en résulte quelquefois des dangers sérieux. Dans l'usage des cartes marines, on éprouve le même embarras, et un premier méridien unique sera, pour nous marins, d'une grande utilité.

Pendant les deux années qui viennent de s'écouler, nous avons eu lieu d'espérer que nous pourrons voir se réaliser ce grand desideratum, et dans le courant de l'année dernière une conférence savante, où beaucoup de nations étaient représentées, a émis une opinion avec une remarquable unanimité et a traité la question dans un esprit très catholique.

Je n'abuserai plus de votre attention, excepté pour vous présenter les sujets que nous sommes appelés à discuter, savoir: l'adoption d'un premier méridien unique et l'introduction d'une heure universelle, et je vous prierai de compléter notre organisation en procédant à l'élection d'un Vice-Président et des Secrétaires nécessaires pour dresser le compte-rendu de nos travaux.

M. A. LEFAIVRE, délégué de France, au nom de son collègue et du sien, propose que toutes les motions et discours faits en langue anglaise soient traduits en français.

Le PRÉSIDENT demande si la proposition faite par le délégué français est agréée par la Conférence. Cette proposition est approuvée à l'unanimité.

Le PRÉSIDENT dit ensuite qu'il est prêt à proposer à la Conférence de procéder à l'élection d'un Vice-Président.

M. le Comte LEWENHAUPT, délégué de Suède, fait remarquer que les élections dans les réunions composées d'un grand nombre de membres sont toujours difficiles, et demande s'il est absolument nécessaire d'avoir un Vice-Président. Il ajoute que, pour lui, il pense qu'il y a tout lieu d'espérer qu'on n'aura pas besoin des services d'un Vice-Président.

L'assemblée, consultée, consent à se passer d'un Vice-Président.

Le PRÉSIDENT dit ensuite qu'il faut procéder à l'élection des Secrétaires; il ajoute cependant que, en raison de la convenance d'une consultation à cet égard, cette élection pourrait avoir lieu demain.

M. VALERA, délégué d'Espagne, dit qu'il ne voit nullement pourquoi la nomination des Secrétaires ne peut pas se faire à présent, aussi bien qu'à une autre époque.

M. LEFAIVRE, délégué de France, demande quelles fonctions les Secrétaires seront appelés à exercer.

Le PRÉSIDENT répond que la personne qui remplit maintenant les fonctions de Secrétaire a été nommée par le Secrétaire d'État; qu'il est en même temps sténographe et que c'est lui qui sera chargé principalement de dresser les procès-verbaux des séances de la Conférence; qu'il faut cependant nommer des Secrétaires réguliers pour examiner et vérifier les protocoles tous les jours, ce qui sera d'autant plus important s'il faut rédiger ces protocoles en deux ou trois langues; et que ces Secrétaires doivent être membres de la Conférence, pour que les actes de celle-ci aient l'authenticité requise; et que, vu le caractère des travaux dont il s'agit, ces Secrétaires doivent être, par leurs connaissances, bien au courant des matières qu'on doit discuter.

M. SOTELDO, délégué de Vénézuéla, est d'avis que la Conférence devrait s'ajourner à demain, puisqu'on a déjà assez fait en arrêtant une premiére organisation; que si l'on s'ajourne, cela donnera du temps aux délégués pour se consulter quant aux fonctions des Secrétaires, et quant aux personnes qui seront les plus propres à remplir ces fonctions; qu'il y a des représentants des différents pays qui ne connaissent pas la langue anglaise, et que la Conférence pourra se décider demain quant aux langues dans lesquelles les actes doivent être rédigés, quoique, selon lui, il convient que les langues adoptées soient le français et l'anglais. Il propose donc que la Conférence s'ajourne à demain.

M. LEFAIVRE, délégué de France, dit qu'il est de l'opinion de M. le Président, savoir, que la Conférence doit avoir des secrétaires possédant des connaissances spéciales, et que les actes doivent être rédigés en deux langues. Il pense que, si l'on s'ajourne à demain, les délégués auront le temps de réfléchir sur le sujet et de se préparer à voter en connaissance de cause.

M. le PRÉSIDENT fait observer que si quelqu'un des délégués veut faire des propositions relatives aux travaux de demain, la Conférence pourra procéder à l'examen de ces matières après l'élection des Secrétaires, et il propose au délégué de Vénézuéla (M. Soteldo) que sa motion d'ajournement soit retirée pour le moment.

M. SOTELDO, délégué de Vénézuela, retire sa motion.

M. FREY, délégué de Suisse, exprime l'opinion qu'avant tout il conviendrait qu'une discussion générale soit portée à l'ordre du jour de demain.

M. VALERA, délégué d'Espagne, dit qu'il est d'avis que les actes de

la Conférence doivent être rédigés en deux langues au moins, et qu'on doit choisir des Secrétaires bien versés dans ces langues et dans les matières que la Conférence est appelée à discuter ; que, pour que les procès-verbaux des séances soient bien dressés, il faut des secrétaires réunissant ces connaissances. Il ajoute qu'il est préférable de les élire après consultation préalable parmi les membres de la Conférence, consultation qui pourra bien avoir lieu avant la réunion de demain.

M. le Comte LEWENHAUPT, délégué de Suède, dit qu'il ne voit aucun obstacle à décider dès à présent que l'ordre du jour de demain comporte d'abord l'élection des secrétaires, et ensuite une discussion générale, et il propose qu'on adopte cette résolution.

La proposition est adoptée à l'unanimité.

M. le Professeur ABBE, délégué des États-Unis, demande si les travaux de la Conférence ne seraient pas facilités pour demain si le Président nommait un comité à présent, ayant pouvoir de présenter les Secrétaires.

Le PRÉSIDENT répond en demandant si l'on ne ferait pas mieux de nommer ce comité à une réunion subséquente, plutôt qu'à celle d'aujourd'hui, qui est la première.

M. le Commandant SAMPSON, délégué des États-Unis, annonce qu'à la séance de demain il soumettra à la Conférence la question de savoir si les réunions doivent être publiques ou non, et qu'il présentera, en temps opportun, une motion pour demander l'avis de la Conférence sur la convenance d'inviter des savants distingués, dont quelques-uns sont maintenant à Washington, et qui désirent peut-être assister aux réunions, et prendre part à la discussion des questions à traiter.

M. LEFAIVRE, délégué de France, déclare que quant à ce qui regarde la première proposition, c'est-à-dire, de rendre publiques les sessions, il y est opposé, parce qu'il pense qu'en ouvrant les portes du Congrès au public, on n'y trouverait aucun avantage et que les sessions pourraient être retardées et embarrassées par une telle autorisation.

M. le Professeur ADAMS, délégué d'Angleterre, déclare qu'il n'approuve pas la première proposition, c'est-à-dire, celle de rendre publiques les séances de ce Congrès ; mais il est d'accord en ce qui concerne la seconde proposition, et pense qu'elle est très importante et d'une grande valeur.

Le PRÉSIDENT fait observer que les propositions faites par le délégué des États-Unis d'Amérique sont uniquement en forme d'avis, qu'elles ne sont pas présentées à la Conférence maintenant, et que par conséquent elles ne seront pas sujettes à discussion ; toutefois, il pense qu'un échange préalable d'opinions est fort utile.

M. le Capitaine STEWART, délégué du Paraguay, dit qu'il pense que ce serait une très bonne chose, en vue de la proposition de rendre publiques les séances de la Conférence, d'inviter tout le monde au Capitole pour la discussion des divers sujets.

M. le Professeur ABBE, délégué des États-Unis, dit qu'il sera facile de faire imprimer en entier les discussions de la Conférence chaque jour, pour l'usage des délégués, et que le public sera, par ce moyen, informé des actes, si cela est nécessaire.

Le PRÉSIDENT annonce que des mesures ont été prises par le Département de l'État, par lesquelles les actes de chaque jour seront imprimés et fournis en temps et lieu pour être examinés par les membres du Congrès avant la prochaine réunion, et qu'ils seront imprimés en deux langues, en français et en anglais ; mais que les protocoles ne pourront être régulièrement vérifiés avant que le Congrès n'ait désigné les secrétaires compétents.

M. le Baron VON SCHÆFFER, délégué d'Autriche-Hongrie, demande qu'une liste des délégués soit présentée à chacun des membres du Congrès.

Le PRÉSIDENT répond qu'il chargera le secrétaire provisoire (M. Peddrick) de préparer une liste des délégués.

Sur la proposition de M. DE STRUVE, délégué de Russie, le Congrès s'ajourne à demain, jeudi, à une heure de l'après-midi.

PROTOCOLE II.

SÉANCE DU 2 OCTOBRE 1884.

La Conférence se rassemble à une heure de l'après-midi.

Sont présents:

Pour l'Allemagne: M. le Baron H. von Alvensleben et M. Hinckeldeyn.
Pour l'Autriche-Hongrie: M. le Baron Ignatz von Schæffer.
Pour le Brésil: M. le Dr. Luiz Cruls.
Pour la Colombie: M. le Commodore S. R. Franklin.
Pour Costa-Rica: M. Juan Francisco Echeverria.
Pour l'Espagne: M. Juan Valera, M. Emilio Ruiz del Arbol, et M. Juan Pastorin.
Pour les États-Unis: M. le Contre-Amiral C. R. P. Rodgers, M. Lewis M. Rutherfurd, M. W. F. Allen, M. le Commandant W. T. Sampson, et M. le Professeur Cleveland Abbe.
Pour la France: M. A. Lefaivre et M. Janssen.
Pour la Grande-Bretagne: Sir F. J. O. Evans, M. J. C. Adams, M. le Général Strachey, et M. Sandford Fleming.
Pour le Guatémala: M. Miles Rock.
Pour Hawaïi: M. W. D. Alexander et M. Luther Aholo.
Pour l'Italie: M. le Comte Albert de Foresta.
Pour le Japon: M. Kikuchi.
Pour le Mexique: M. Leandro Fernandez et M. Angel Anguiano.
Pour le Paraguay: M. le Capitaine John Stewart.
Pour la Russie: M. C. de Struve, M. le Général J. Stebnitzki, et M. J. de Kologrivoff.
Pour Saint-Domingue: M. M. de J. Galvan.
Pour Salvador: M. Antonio Batres.
Pour la Suède: M. le Comte Carl Lewenhaupt.
Pour la Suisse: M. le Colonel Émile Frey.
Pour le Vénézuéla: Señor Dr. A. M. Soteldo.

Étaient absents:

Pour le Chili: M. F. V. Gormas et M. A. B. Tupper.
Pour le Danemark: M. C. S. A. de Bille.
Pour la Libéria: M. W. Coppinger.
Pour les Pays-Bas: M. G. de Weckherlin.
Pour la Turquie: Rustem-Effendi.

L'ordre du jour appelle en premier lieu la nomination de secrétaires.

M. DE STRUVE, délégué de Russie, exprime l'opinion qu'il sera très difficile d'élire les secrétaires en votant directement, et il propose que le choix de ces fonctionnaires soit confié à une commission nommée par le Président, que cette commission présente à la Conférence les noms

des délégués choisis comme secrétaires, et que ceux-ci soient au nombre de quatre.

M. le Comte de LEWENHAUPT, délégué de la Suède, dit que les délégués sont généralement d'accord entr'eux pour élire comme secrétaire M. Hirsch, l'un des représentants de la Suisse, vu qu'il était un des secrétaires du Congrès tenu à Rome; mais comme il n'est pas encore arrivé, il propose au Congrès de n'élire que trois secrétaires pour aujourd'hui.

M. DE STRUVE, delégué de Russie, dit qu'il croit que M. Hirsch arrivera bientôt, et il accepte l'amendement présenté.

La première motion ainsi modifiée par l'amendement est adoptée à l'unanimité.

Le PRÉSIDENT nomme le délégué de Russie, M. de Struve; le délégué d'Espagne, M. Valera; le délégué de France, M. Lefaivre, et le délégué de la Suède, le Comte Lewenhaupt, comme membres de la commission chargée de présenter les secrétaires au choix du Congrès.

Le Congrès s'ajourne alors, pour un instant, afin de mettre la commission à même de se consulter et de faire ensuite son rapport.

Le Congrès s'assemble de nouveau.

Le Comte DE LEWENHAUPT, délégué de la Suède, annonce que la commission a dressé sa liste et propose:

Le délégué de la Grande-Bretagne, le Lieutenant-Général Strachey; le délégué de la France, M. Janssen; et le délégué du Brésil, le Dr. Cruls.

Les propositions de la commission sont adoptées alors à l'unanimité par le Congrès, et les délégués sus-nommés comme Secrétaires, déclarent qu'ils acceptent leur nomination.

M. DE STRUVE, délégue de Russie, propose que le Président charge le Secrétaire provisoire de distribuer les places des délégués d'après l'ordre alphabétique des noms des pays qu'ils représentent. Il ajoute qu'il y aura un grand avantage à ce que chaque membre ait une place fixe et permanente.

La motion est acceptée à l'unanimité.

Le Commandant SAMPSON, délégué des État-Unis, présente alors la résolution suivante:

Le Congrès invite M. le Professeur Newcomb, directeur de l'Almanach nautique des États-Unis; M. le Professeur Hilgard, directeur du Coast and Geodetic Survey; M. le Professeur A. Hall; M. le Professeur De Valentiner, directeur de l'Observatoire de Carlsruhe, et Sir William Thomson, à assister aux réunions de ce Congrès.

Le Général STRACHEY, délégué d'Angleterre, dit que s'il a bien compris cette résolution, il n'en résultera pas pour les invités le droit de prendre part aux discussions.

Le PRÉSIDENT répond que la résolution paraît simplement inviter ces messieurs à assister aux réunions de la Conférence.

Le Général STRACHEY dit qu'il juge nécessaire d'éclaircir un peu la question; que si les invités ne peuvent pas prendre la parole, il lui semble qu'il y a à peine lieu de les inviter, que ce n'est pas pour leur profit, mais pour celui du Congrès, qu'on a fait cette invitation à ces savants, et par conséquent il pense que l'intention de la Conférence, en es invitant, était de profiter de leurs lumières pendant la discussion des matières à traiter. Il pense que si quelques observations faites par ces messieurs sont présentées au Congrès avec l'autorisation de l'assemblée donnée par l'intermédiaire du Président, cela répondra à toutes les exigences.

Le PRÉSIDENT demande si le délégué de la Grande-Bretagne entend que les observations que pourraient faire les invités soient écrites avant d'être présentées.

Le Général STRACHEY répond que cela n'est pas absolument nécessaire.

Le Professeur ABBE, délégué des États-Unis, demande si les noms contenus dans la résolution sont les seuls qui doivent être compris dans l'invitation.

Le PRÉSIDENT répond que oui, mais qu'on pourra toujours sans violer l'ordre ajouter de nouveaux noms de la même manière.

Le Professeur ABBE, délégué des États-Unis, dit que c'est une chose à laquelle il tient beaucoup, et il désire ajouter que quelques-unes des nations qui ont été invitées à envoyer des délégués à ce Congrès ne l'ont pas fait, et que ce sera une politesse que d'inviter des personnes distinguées de ces nations à assister aux séances.

M. le Commandant SAMPSON, délégué des États-Unis, dit qu'il a rédigé la résolution, après avoir consulté quelques-uns des délégués, et qu'on lui a fait observer ce matin qu'il y aura probablement quelque divergence d'opinions sur la question de savoir si ces messieurs doivent être admis à prendre part aux discussions, et que c'est pour cette raison que dans la première résolution on les invite simplement à assister aux séances.

Il dit qu'il se propose de soumettre plus tard à la Conférence une autre résolution donnant le droit à ces messieurs de prendre part aux discussions, et qu'il pense que la première intention était de conférer un honneur à des savants distingués, et que le Congrès fera bien de limiter ces invitations à de telles personnes.

M. LEFAIVRE, délégué de France, dit qu'il s'oppose à la proposition d'admettre aux délibérations de cette Conférence des personnes, quelque distinguées ou quelque éminentes qu'elles soient, à moins qu'elles n'aient été spécialement déléguées par leurs Gouvernements comme membres de ce corps. Il doute que la Conférence ait qualité d'admettre à ses discussions des hommes qui n'ont pas été régulièrement désignés pour traiter les matières dont il s'agit; il dit que cette Conférence internationale a été créée pour produire un échange de vues de la part des représentants des différents Gouvernements; que si cette Conférence écoute les avis de personnes non autorisées à parler au nom des Gouvernements qui ont envoyé des délégués ici, cela élargira la portée des travaux de ce corps; qu'il y aura une grande divergence d'opinions parmi de tels hommes, ce qui tendra à embarrasser la Conférence plutôt qu'à l'aider à arriver à un accord. Il insiste pour faire observer que c'est une affaire qui ne concerne que les Gouvernements, et tandis qu'il prendrait plaisir à faire des civilités à des hommes aussi distingués dans la science que ceux qu'on se propose d'inviter, il croit de son devoir de s'opposer à la proposition, vu les circonstances.

Le PRÉSIDENT dit que, suivant sa manière de voir, la résolution n'a pas pour objet de donner le droit de voter aux invités, mais seulement de les mettre à même de communiquer à la Conférence les lumières qu'ils pourront posséder sur les matières à traiter.

M. LEFAIVRE, délégué de France, fait remarquer que la proposition avait pour but d'autoriser ces messieurs à prendre part aux délibérations de la Conférence; il exprime l'opinion que, si l'on étend ce privilège à des personnes qui ne sont pas autorisées à représenter leurs Gouvernements, il en résultera des inconvénients fort graves. Il n'est pas juste, à son avis, que ses vues soient combattues par celles de personnes n'ayant pas qualité de parler au nom de leurs Gouvernements.

M. le Général STRACHEY, délégué de la Grande-Bretagne, dit que puisqu'il s'est permis de faire quelques observations à l'égard de la manière d'inviter ces savants, et de leurs droits après qu'ils auront été invités, il tient à faire remarquer que, quoique d'accord sur une grande partie avec ce qui a été dit par le délégué de France, il pense que ces

messieurs doivent avoir le droit d'exprimer leurs opinions, et non pas qu'ils viennent tout simplement pour écouter celles des membres de cette Conférence.

Le PRÉSIDENT ordonne la lecture de la proposition en français, et la met aux voix. La proposition est approuvée à l'unanimité.

M. le Commandant SAMPSON, délégué des États-Unis, fait ensuite la proposition suivante:

Les personnes qui viennent d'être invitées à assister aux réunions de cette Conférence sont autorisées à prendre part à la discussion de toutes les questions scientifiques qui y seront traitées.

M. LEFAIVRE, délégué de France, déclare que ce n'est pas conforme au but de la Conférence que des personnes, non autorisées par leurs Gouvernements respectifs, soient admises à influer sur la décision de cette assemblée, et que, quoiqu'il soit très convenable d'appliquer la mesure de courtoisie à des personnes aussi savantes que celles qui sont invitées, il est certain qu'on n'a jamais eu l'intention de les autoriser à prendre part à nos débats.

M. le Général STRACHEY, délégué de la Grande-Bretagne, dit qu'il croit éviter des inconvénients en exprimant ses vues, lesquelles, s'il ne se trompe, ne sont pas fort divergentes de celles du délégué de la France. Il ajoute que s'il n'y a pas d'objection, il prendra la liberté de lire une proposition qui pourra être adoptée, croit-il, à la place de celle qui est soumise actuellement à la Conférence. Il propose donc la motion suivante:

Le Président est autorisé, avec le consentement des délégués, à demander aux personnes invitées à assister au Congrès, d'exprimer leurs vues dans la discussion de toute question sur laquelle ces vues pourront être utiles.

Le PRÉSIDENT demande de quelle manière les invités devront exprimer leurs vues.

M. le Général STRACHEY, délégué de la Grande-Bretagne, répond qu'ils devront les exprimer de vive voix.

Le PRÉSIDENT répond que tel est, sans doute, le sens de la proposition, telle elle a été lue.

M. le Général STRACHEY, délégué de la Grande-Bretagne, dit que les paroles "à prendre part à la discussion" qui se trouvent dans la propotion du Commandant Sampson, indiqueraient que les invités seront autorisés de répondre, de leur propre mouvement, aux remarques qu'on aura faites, d'exprimer leur manière de voir, et de prendre part à la discussion des questions, exactement comme les délégués ont le droit de le faire.

M. LEFAIVRE, délégué de France, dit qu'il espère que le délégué de la Grande-Bretagne n'insistera pas sur l'adoption de sa proposition avant que la première proposition ait été mise aux voix.

Le PRÉSIDENT met la proposition aux voix; mais ne pouvant pas décider si le vote donné de vive voix est pour l'affirmative ou la négative, il annonce qu'on va demander l'avis de chaque membre à tour de rôle.

M. FREY, délégué de Suisse, est d'avis que, avant qu'on demande les avis, on fera bien de décider la question de savoir comment les délégués doivent voter, c'est-à-dire, s'ils doivent voter comme nations ou comme individus.

Le PRÉSIDENT dit qu'il est d'habitude dans toutes les Conférences semblables de voter comme nations, chaque nation déposant un vote, et qu'il n'y a pas d'autre moyen qui semble praticable; que conformé-

ment à cette habitude, l'appel sera fait et les votes seront pris à tour de rôle.

L'appel étant fait, les États suivant votent pour l'affirmative : Costa-Rica, Italie, Saint-Domingue, Suisse, Guatémala, Mexique, Salvador, Vénézuéla.

Et les suivants pour la négative : Autriche-Hongrie, Colombie, Allemagne, Hawaiï, Paraguay, Espagne, États-Unis, Brésil, France, Grande-Bretagne, Japon, Russie, Suède.

Le PRÉSIDENT annonce que les voix en faveur de la proposition sont au nombre de 8, et celles contraire au nombre de 13, qu'en conséquence la proposition n'est pas adoptée.

M. le Général STRACHEY, délégué de la Grande-Bretagne, renouvelle sa proposition, qui est ainsi formulée :

Le Président est autorisé, avec l'assentiment des délégués, à demander une énonciation des opinions des invités au Congrès sur tout sujet sur lequel leur opinion pourra avoir quelque valeur.

Cette résolution ne donne lieu à aucune discussion, et est approuvée.

M. le Commandant SAMPSON, délégué des États-Unis, fait alors la proposition suivante :

Les réunions de ce Congrès sont ouvertes aux visiteurs qui s'y intéressent.

M. LEFAIVRE, délégué de la France, dit qu'il considère ce sujet comme étant d'une grave importance ; que c'est ici un corps officiel et confidentiel ; scientifique, c'est vrai, mais en même temps diplomatique ; qu'il est autorisé à conférer sur des matières auxquelles le public n'a rien à voir pour le moment ; qu'admettre le public aux réunions serait en détruire le secret, et exposerait le Congrès à l'influence d'une pression extérieure qui pourrait être très nuisible à ses débats, et que par conséquent il s'oppose absolument à cette proposition.

La discussion étant épuisée, le PRÉSIDENT, après un vote de vive voix, déclaré douteux, fait faire l'appel, et les États suivants votent affirmativement : Colombie, Espagne, Salvador, Vénézuéla, Costa-Rica, Guatémala, Paraguay.

Les États suivants votent négativement : Allemagne, Autriche-Hongrie, États-Unis, France, Grande-Bretagne, Italie, Mexique, Saint-Domingue, Suisse, Brésil, Hawaiï, Japon, Russie, Suède.

Le PRÉSIDENT annonce qu'il y a 7 voix pour et 14 contre, et que par conséquent la proposition n'est pas adoptée.

Le PRÉSIDENT dit ensuite qu'il y aura sans doute quelque discussion préliminaire générale devant le Congrès, et il ajoute que si les délégués désirent être entendus sur ce sujet, il conviendrait d'en donner avis au Secrétaire.

Le Professeur ABBE, délégué des États-Unis, fait alors la proposition suivante :

Vu que plusieurs personnes désirent soumettre à ce Congrès des inventions, des projets, et des systèmes d'une heure universelle : le Congrès arrête qu'il accusera réception à ces personnes de leurs communications, mais qu'il s'abstiendra de toute expression d'opinion à l'égard de leurs mérites respectifs.

Le Professeur ADAMS, délégué de la Grande-Bretagne, dit que le Congrès doit être très circonspect en admettant des projets, des plans de personnes n'ayant aucune relation avec ce corps ; qu'il y a sans doute beaucoup d'inventeurs et de personnes qui ont des plans et des dessins qu'elles désirent faire accepter par la Conférence, et qu'il est probable que le Congrès s'exposera à de grands inconvénients s'il prend sur lui d'accuser réception de leurs communications.

Le PRÉSIDENT dit qu'il a reçu plusieurs communications de ce genre,

entre autres, une qui lui propose de prendre Jérusalem comme méridien initial.

M. LEFAIVRE, délégué de la France, propose que le Congrès nomme une commission pour examiner les différentes communications qui seront faites par des personnes étrangères, et pour soumettre les propositions qu'elle jugera utiles après avoir examiné ces communications.

M. VALERA, délégué de l'Espagne, dit qu'il lui semble que la meilleure manière de procéder c'est de discuter le sujet article par article; qu'il y a des propositions bien définies qui ont été présentées au Congrès, et qu'en outre de ces propositions il y a les résolutions qui ont été adoptées par la Conférence de Rome, qui pourraient être prises comme base des discussions de ce Congrès; que par ce moyen les délégués auront devant eux des sujets précis à discuter; et qu'après la discussion, si quelque proposition a besoin d'être modifiée ou changée, le Congrès est libre de le faire; mais à moins qu'on n'adopte des méthodes régulières dans les débats, les séances seront prolongées indéfiniment, et le Congrès tombera dans la confusion à cause de la multitude des propositions étrangères à la question qui pourront lui être présentées.

M. RUTHERFURD, délégué des États-Unis, dit qu'il lui semble que si l'on veut engager une discussion générale sur le sujet, lequel a indubitablement de nombreuses ramifications, la meilleure méthode à suivre serait celle qu'on a proposée; que si l'on se décide à suivre un ordre bien défini, cela épargnera beaucoup de temps, et il y aura de l'exactitude dans les débats, ce qui est indubitablement toujours précieux; que par ce moyen la discussion sera tenue dans de justes limites; mais à moins qu'il n'y ait quelque proposition indécise devant le Congrès, il est impossible de dire si une discussion est en règle ou non; qu'il lui semble que quelques propositions bien définies devraient être soumises au Congrès, et que ces propositions pourraient être facilement recueillies, non-seulement de ce qui a précédé, non-seulement de la Conférence tenue à Rome, mais des lois du Congrès et des circulaires du Secrétaire d'État, en conformité desquelles ce corps a été organisé.

Le PRÉSIDENT dit que si ces communications de dehors étaient soumises au Congrès, cela imposerait beaucoup de travail.

La proposition du délégué des États-Unis, M. le Professeur Abbe, ayant été mise aux voix, est ensuite rejetée.

M. RUTHERFURD, délégué des États-Unis, fait ensuite la proposition suivante :

> La Conférence propose aux Gouvernements représentés d'adopter pour premier méridien celui de Greenwich, passant par le centre de l'instrument méridien de l'Observatoire de Greenwich.

M. LEFAIVRE, délégué de la France, dit que la résolution n'est pas en règle, et que son collègue, M. Janssen, s'adressera à la Conférence sur ce sujet.

La compétence de la Conférence, dit-il, ne saurait faire l'objet d'un long débat entre nous.

Disons d'abord qu'il n'y a pas d'engagement préalable entre les Gouvernements d'accepter les résultats de nos discussions, et que par conséquent il ne saurait être question d'assimiler nos décisions à celles d'un Congrès délibérant ou d'une commission internationale procédant suivant des pouvoirs définis.

Nous n'avons pas de pouvoirs définis, ou plutôt nous n'avons aucune force exécutive, puisque nos décisions ne pourront être invoquées exécutoirement par aucun Gouvernement vis-à-vis des autres.

Est ce à dire qu'aucune autorité ne s'attachera à nos décisions? Une assemblée qui compte tant de diplomates éminents et d'illustrations

scientifiques est certainement un objet de grand respect pour toutes les puissances, mais ce sera une puissance toute morale, et qui devra être mise en balance avec des droits, des intérêts non moins considérables, laissant pleine et entière l'indépendance de chaque État individuellement.

Dans ces conditions, messieurs, il me semble que notre rôle est tout tracé. De notre Conférence doit sortir l'expression d'une vœu collectif, un projet de résolution qui sera voté par la majorité de cette assemblée, et soumis ensuite à l'acceptation des Gouvernements respectifs. Telle est notre mission. Elle est grande, d'une haute portée internationale. Mais il importe que nous en comprenions tout d'abord le domaine, et que nous n'en dépassions par les limites.

On a invoqué la décision de la Conférence de Rome; mais, messieurs, je ferai remarquer que cette Conférence était purement composée de spécialistes, et qu'elle n'avait aucune mission pour examiner la question internationale. Notre assemblée à nous est composée de divers éléments, parmi lesquels nous comptons des savants du plus grand mérite, mais aussi des hommes, des fonctionnaires d'un rang élevé, étranger au domaine scientifique et devant envisager la question au point de vue des intérêts politiques, nous avons le droit aussi d'être philosophes, cosmopolites, d'examiner les intérêts de l'humanité, non-seulement pour le présent, mais pour l'avenir le plus éloigné.

Vous voyez, messieurs, que notre liberté est entière, et que nous ne sommes nullement liés par les décisions de la Conférence de Rome. Il est même désirable que ces précédents soient aussi peu invoqués que possible, puisque nous avons parmi nous des savants qui font autorité dans les deux mondes et parfaitement capables de nous orienter dans les matières techniques, de nous y fournir toutes les lumières désirables. Je dirai plus: C'est que les résultats de la Conférence de Rome n'ont aucune autorité officielle auprès des Gouvernements qui nous accréditent. Car si on les avait pris comme point de départ, notre Conférence n'aurait aucune raison d'être, et les Gouvernements n'auraient, dès à présent, qu'à se prononcer pour l'acceptation ou la non-acceptation des résolutions votées par le Congrès géodésique de Rome. Mais tout est intact, et même dans les côtés scientifiques; c'est pour cela que nous avons avec nous un si grand nombre de délégués techniques.

Le PRÉSIDENT dit qu'il considère la proposition parfaitement en ordre, et qu'elle amènera peut-être une discussion sur le sujet même pour lequel la Conférence a été convoquée; que la proposition est sujette aux amendements qu'on pourra présenter; qu'elle peut être modifiée si cela est nécessaire, et que, si elle n'est pas approuvée par le Congrès, elle peut être rejetée.

M. LEFAIVRE, délégué de France, demande si cette proposition n'exige pas une solution immédiate.

M. RUTHERFURD, délégué des États-Unis, répond qu'on ne médite rien de pareil.

M. le Professeur JANSSEN, délégué de France, prend alors la parole:

MESSIEURS: Je demande formellement que la proposition qui vient d'être faite par mon éminent collègue et ami, M. Rutherfurd, soit réservée et ne soit pas mise maintenant en discussion.

Il n'est pas admissible qu'une proposition aussi grave, qui vise une des résolutions les plus importantes que nous ayons à prendre, soit soumise au vote lorsque notre bureau est à peine constitué et qu'aucune discussion sur le fond des questions qui nous sont soumises n'a été abordée.

Ce serait renverser l'ordre nécessaire des choses et passer à la conclusion avant l'étude du sujet lui-même.

Avant la question du choix du méridien qui sera appelé à jouer le rôle de méridien initial international, si même le Congrès juge à propos d'aborder ce point, il est évident que nous devons d'abord statuer sur la question de principe qui domine tous nos débats, à savoir s'il y a convenance d'instituer un méridien de départ commun pour toutes les nations. Je demande donc formellement l'ajournement de la proposition de M. Rutherfurd.

Le PRÉSIDENT dit que comme il a été fait mention de la Conférence de Rome, son désir est détablir qu'il avait soigneusement évité de faire allusion à cette Conférence, et que les délégués des États-Unis ne trouvaient dans leurs instructions aucune indication s'y rapportant; que, dans son esprit, le seul but de la résolution proposée par le délégué des États-Unis était simplement de soumettre à la Conférence la question du méridien initial; il ne considérait même pas la motion du délégué comme une expression d'opinion sur ce sujet, mais qu'il avait été distinctement établi, lorsque la résolution avait été présentée à la Conférence, qu'elle avait pour but de mettre les délégués en mesure de procéder immédiatement à la discussion. Le Président ajoute, en outre, que la résolution peut être amendée si les délégués de France désirent le faire.

M. le Commandant SAMPSON, délégué des États-Unis, annonce qu'il désire présenter ce qui suit pour être substitué à la résolution dont il s'agit:

Le Congrès est d'avis qu'il est désirable d'adopter un méridien initial unique pour toutes les nations au lieu et place des méridiens multiples qui existent actuellement.

M. RUTHERFURD, délégué des États-Unis, déclare alors qu'il accepte cette substitution.

M. le Général STRACHEY, délégué d'Angleterre, dit que s'il a bien compris les observations faites par le délégué de France, M. Lefaivre, il croit qu'il a voulu appeler l'attention sur la forme définitive dans laquelle les résolutions du Congrès devraient être établies. Dans le discours que le Secrétaire d'État des États-Unis, Mr. Frelinghuysen, avait adressée aux délégués au moment de leur réunion, celui-ci dit: "Vous vous êtes réunis pour considérer et discuter la question importante d'un premier méridien pour toutes les nations. C'est à vous de donner un résultat définitif aux travaux préparatoires d'autres associations savantes et congrès spéciaux, et de rendre ces travaux utiles au monde entier."

Il ajoute que le but de la Conférence devait être de prendre une série de résolutions que l'on pût soumettre aux divers Gouvernements dont les représentants étaient assemblés, afin de les engager à accepter la décision à laquelle la Conférence pourrait arriver; et, enfin, donner à ces résolutions la forme diplomatique, forme plus définie et plus précise que les simples résolutions qui pourraient être adoptées par une assemblée purement scientifique; que telle était la position prise par les délégués de cette Conférence. L'orateur ajoute qu'il lui semble nécessaire, après avoir établi quelle forme devait être donnée aux résolutions, de procéder à leur étude, les discuter, ensuite les réunir et les coordonner de façon à ce qu'elles présentent un ensemble régulier et satisfaisant des actes de l'assemblée. Il est presque certain que les discussions ne pourront être très méthodiques mais que l'on pourrait ultérieurement procéder à une révision des matériaux qui devront servir à élever l'édifice. Il ne désire pas, en l'état actuel, discuter les mérites de la

question à l'étude; il croit, en ce qui le concerne, plus prudent de s'abstenir, mais en ce qui concerne les observations de ses honorables amis, les délégués de France, il ne pouvait pas admettre que ce qui avait été fait à Rome pût être écarté; les discussions de Rome avaient une grande valeur; elles allaient bien avant dans la question, et il supposait que chacun des membres de la Conférence était possesseur des rapports relatifs à ce qui s'y était passé.

Il dit aussi qu'il lui semblait que le délégué français, M. Lefaivre, était allé un peu loin, lorsqu'il avait dit qu'il fallait fermer les yeux sur ce qui avait été fait à Rome; que, pour sa part, il était obligé d'en tenir compte; que plusieurs savants des plus distingués, appartenant à diverses nationalités, s'y étaient trouvés et avaient discuté à fond les questions posées; et que les délégués ici réunis avaient maintenant pour mission de considérer encore ce qui s'était fait là-bas.

M. RUTHERFURD, délégué des États-Unis, dit que dans ses observations le délégué français, M. Lefaivre, a insisté pour que l'on déterminât d'abord dans quel but les délégués étaient ici assemblés; il exprime le désir que l'on se réfère aux circulaires expédiées par le Gouvernement des États-Unis, et en vertu desquelles la Conférence s'est assemblée. Il ajoute pouvoir affirmer, sans crainte d'être contredit, que dans ces communications le Président a déclaré que l'on considérait comme admis qu'un méridien initial était désirable; que telle était la base sur laquelle s'appuyait le Président en faisant ses invitations; il ne s'explique pas comment il est arrivé à cette conclusion ni si les actes de Rome ont eu ou non quelque influence, mais il pense qu'ils en ont eu une grande sur l'esprit du Président; qu'il n'est pas douteux qu'il n'ait pas agi sous cette seule influence, et qu'en conséquence le Secrétaire d'État présenta d'abord une proposition à titre d'essai, dans le but de découvrir si un autre Congrès serait acceptable; le résultat avait été que tous les pays ici représentés avaient répondu par l'affirmative à sa circulaire; qu'ils étaient d'accord avec lui sur l'opportunité d'une conférence dans le but indiqué.

L'orateur continue, disant qu'alors le Secrétaire d'État avait adressé une seconde invitation pour que des délégués fussent envoyés et qu'ils se réunissent ici le premier Octobre 1884, dans le but d'établir un méridien initial et une heure universelle. Il ajoute qu'à son point de vue on perdrait beaucoup de temps à discuter de nouveau la question de savoir si un méridien unique était ou non désirable; que les délégués étaient envoyés pour convenir d'un méridien unique. Il demande pourquoi cette Conférence perdrait son temps à discuter cette question.

La résolution en substitution, présentée par le Commandant Sampson, à savoir: "Le Congrès est d'avis qu'il est désirable d'adopter un méridien initial unique pour toutes les nations au lieu et place des méridiens multiples qui existent actuellement" est mise aux voix et unanimement acceptée.

M. RUTHERFURD, délégué des États-Unis, renouvelle sa résolution originale en ces termes:

> La Conférence propose aux Gouvernements représentés d'adopter comme méridien fondamental celui de Greenwich, passant par le centre de l'instrument méridien de l'Observatoire de Greenwich.

M. JANSSEN, délégué de France, déclare qu'il désire renouveler les objections qu'il a déjà présentées à la première résolution, et s'exprime ainsi qu'il suit:

MESSIEURS: Nous pensons, mon honorable collègue, M. Lefaivre, et moi, que la mission de ce Congrès réside surtout dans l'examen des questions de principe.

J'estime que nous faisons une chose déjà considérable en proclamant le principe de l'adoption d'un méridien initial qui sera le même pour toutes les nations.

Les avantages d'un semblable méridien ont été sentis par les géographes et les navigateurs de tous les temps. La France pourrait même revendiquer l'honneur d'avoir, dès le dix-septième siècle, cherché à réaliser cette réforme. Ce n'est donc pas elle qui pourrait accepter le rôle de mettre obstacle à un progrès qui serait aujourd'hui réalisé si l'on eut persisté dans l'emploi du méridien qu'elle avait prosposé et fait généralement accepter.

Nous sommes donc, messieurs, pleinement d'accord avec vous sur le principe d'un méridien initial international impartialement défini et sagement appliqué, et nous considérons que si le Congrès arrivait à faire accepter définitivement une réforme utile et attendue depuis si longtemps, il aurait rendu au monde un service considérable et qui nous ferait le plus grand honneur.

Ce point acquis, devons-nous passer à la fixation du méridien appelé à jouer ce rôle? Nous ne le pensons pas. A moins qu'une déclaration préalable ne nous rassure sur le principe qui présidera au choix de ce méridien. Sans cette déclaration nous serions sans pouvoirs pour entamer une discussion sur un terrain non défini et où nous ne sommes pas autorisés à nous engager.

Je dois même ajouter que notre acquiescement au principe d'un méridien initial universel ne pourrait être maintenu si le Congrès procédait à un choix qui serait en opposition avec les principes d'ordre exclusivement scientifique que nous sommes chargés de soutenir. Ainsi, dans l'intérêt même du grand principe que nous désirons tous voir adopter, il serait à mon sens plus sage de nous en tenir à une declaration générale; déclaration qui, ralliant toutes les volontés, consacrerait le principe avec toute l'autorité possible. Le principe adopté, nos Gouvernements réuniraient ultérieurement une assemblée, ayant un caractère plus technique que la nôtre, et où les questions d'application seraient plus efficacement étudiées.

M. VALERA, délégué d'Espagne, dit qu'il lui semblait que l'ordre dans lequel devait procéder la Conférence était parfaitement indiqué dans les invitations adressées par le Président des États-Unis aux divers pays, ainsi que dans les articles formulés à Rome; que si ces articles étaient pris les uns après les autres et discutés, il en résulterait pour les délégués une ligne d'action très clairement définie; si l'un des articles se trouvait ne pas être satisfaisant on pouvait le modifier ou l'amender, ou même le rejeter; si les propositions étaient prises une à une, et si les discussions portaient sur ces propositions, il y aurait plus de probabilités pour que la Conférence arrivât à un résultat définitif que si l'on se livrait à une discussion générale.

Le PRÉSIDENT dit que la proposition, telle qu'il la comprenait, ne faisait pas présumer le désir d'un vote immédiat; qu'il était parfaitement juste que le délégué de France présentât toute autre proposition, ainsi que l'avait suggéré le délégué d'Espagne, au lieu et place de la motion inscrite; qu'en ce qui concernait la Présidence, il lui semblait que la Conférence pouvait immédiatement entamer la discussion générale au sujet d'un méridien initial de conformité avec la résolution présentement en suspens; que si le délégué de France désire présenter toute autre proposition, ou une indication quelconque sous une autre forme, on l'écoutera avec la plus grande attention et le plus profond respect.

M. RUTHERFURD, délégué des États-Unis, fait observer que le délégué de France, son savant ami, M. Janssen, avait émis l'opinion que les délégués n'avaient pas pouvoir de décider en faveur d'un méridien spécial, mais qu'ils n'étaient envoyés ici que dans le but de discuter ce principe, à savoir si un méridien universel était désirable. Il ajoute qu'il n'a certainement pas en son pouvoir les instructions que les délégués de France ont reçu de leur Gouvernement, mais qu'il a trouvé parmi les instructions reçues par les délégués des États-Unis, et émanant de leur propre Gouvernement, copie d'une communication faite par le Président des États-Unis au Gouvernement Français, ainsi qu'aux autres nations, par l'entremise du Secrétaire d'État, et où il est dit:

Le Président m'invite, en conséquence, à vous prier de soumettre la question à la considération du Gouvernement de ———, par l'entremise du Ministre des Affaires Étrangères, à l'effet de connaître si son appréciation des bénéfices qu'apporterait aux relations des peuples civilisés l'examen et l'adoption de l'heure universelle proposée est suffisamment d'accord avec celle de ce Gouvernement pour donner lieu à ce qu'il accepte une invitation pour prendre part à une conférence internationale à une date qui serait prochainement fixée.

Le délégué des États-Unis continue et dit que le but de cette Conférence est d'établir non pas ce principe qu'il est désirable de posséder un méridien initial, mais de déterminer ce méridien initial, que tel est le but de la réunion; et qu'il lui semble qu'il doit y avoir de la part du savant délégué de France quelque interprétation erronée sur la faculté que cette Conférence possède pour déterminer un méridien initial; que, à l'égard de l'organisation, M. Lefaivre, délégué de France, avait dit qu'elle n'était pas suffisamment complète pour aborder maintenant ce sujet; mais qu'il lui semble que les délégués disposent de tous les éléments nécessaires et qu'ils sont certainement prêts à écouter et à proposer des arguments pour et contre sur cette question; il suppose que chaque délégué a étudié cette question avant de se rendre à l'assemblée et qu'il ne pensait pas qu'aucun délégué se présentât ici sans savoir, ou tout au moins croire, qu'il sait quelque chose touchant cette même question.

M. VALERA, délégué d'Espagne, annonce qu'il n'a pas le pouvoir d'obliger son pays à ce sujet; que ses pouvoirs ne s'étendent que jusqu'à recommander à son Gouvernement telles résolutions que cette Conférence jugera à propos d'adopter.

M. le Comte LEWENHAUPT, délégué de Suède, dit:

"Je désire constater au protocole que je n'ai aucun pouvoir d'engager mon Gouvernement par mes votes sur les différentes questions qui seront soumises à cette Conférence, et que, par conséquent, les votes doivent seulement être considérés comme un engagement de ma part de recommander à mon Gouvernement les résolutions pour lesquelles je vote."

M. le Général STRACHEY, délégué de la Grande-Bretagne, dit qu'au nom des délégués de la Grande-Bretagne il désire déclarer qu'ils sont dans la même situation, mais que cela n'empêche nullement la Conférence ni les délégués de la Grande-Bretagne de se former une opinion et de l'exprimer.

Le PRÉSIDENT déclare qu'en ce qui concerne les délégués des États-Unis ils n'ont d'autre pouvoir que celui de la discussion et de la recommandation.

M. DE STRUVE, au nom des délégués de la Russie, fait une déclaration identique à celle du délégué de la Suède.

M. le Baron VON ALVENSLEBEN, délégué d'Allemagne, fait une déclaration semblable au nom de son Gouvernement.

M. FERNANDEZ, délégué du Mexique, fait une semblable déclaration.

M. VALERA, délégué d'Espagne, fait observer que cette Conférence a été convoquée non-seulement pour discuter la question d'un méridien initial, mais pour déterminer, dans la mesure afférente à chacun des délégués, la convenance d'adopter un méridien initial déterminé, que son Gouvernement déciderait ensuite s'il y avait lieu pour lui d'accepter les recommandations de la Conférence.

M. CRULS, délégué du Brésil, déclare qu'il a été autorisé à prendre part à la discussion, mais non pas à engager son Gouvernement à accepter telle ou telle proposition.

M. FLEMING, délégué de la Grande-Bretagne, exprime le désir d'appeler l'attention de la Conférence sur la teneur de l'acte du Congrès qui a donné lieu à la réunion de cette Conférence, et dont les termes sont les suivants:

Le Président des États-Unis est autorisé et invité à envoyer aux Gouvernements de toutes les nations avec lesquelles nous entretenons des relations diplomatiques, une invitation de nommer des délégués pour se joindre à des délégués des États-Unis dans la ville de Washington, à telle époque qu'il jugera convenable de désigner, à l'effet de déterminer un méridien pouvant servir de zéro commun pour les longitudes et l'heure universelle sur tout le globe.

Il dit aussi qu'il pense que l'objet du Congrès est évidemment de déterminer et de recommander que, quoique le mot "recommander" ne se trouve pas dans la résolution, il est certainement sous-entendu, et, en effet, le résumé de la résolution votée par les deux chambres des États-Unis contient ce mot; voici ce résumé:

Une loi par laquelle le Président des États-Unis est autorisé à convoquer une Conférence internationale afin de déterminer et de recommander l'adoption universelle d'un méridien initial unique à employer dans le calcul des longitudes, et dans la fixation et l'introduction d'une heure universelle.

Le Baron VON SCHÆFFER, délégué d'Autriche-Hongrie, propose ensuite que la Conférence ajourne à lundi, le 6 courant, à une heure de relevée, afin de mettre les délégués en mesure de conférer préalablement sur ce sujet.

La proposition du délégué d'Autriche-Hongrie est acceptée, et la Conférence s'ajourne au lundi, 6 octobre 1884, à 1 heure de l'après-midi.

PROTOCOLE III.

SÉANCE DU 6 OCTOBRE 1884.

Conformément au jour fixé dans la dernière séance, la Conférence se réunit dans le salon diplomatique du Département d'État, à 1 heure de l'après-midi.

Étaient présents:

Allemagne: M. le Baron H. von Alvensleben, envoyé extraordinaire et ministre plénipotentiaire; M. Hinckeldeyn.

Autriche-Hongrie: M. le Baron Ignatz von Schæffer, envoyé extraordinaire et ministre plénipotentiaire.

Brésil: Dr. Luis Cruls.

Colombie: Commodore S. R. Franklin, Marine des États-Unis.

Costa-Rica: M. Juan Francisco Echeverria.

Espagne: Dr. Juan Valera, envoyé extraordinaire et ministre plénipotentiaire; Dr. Emilio Ruiz del Arbol; Dr. Juan Pastorin.

États-Unis: Contre-Amiral C. R. P. Rodgers, Marine des États-Unis; M. Lewis Rutherfurd; M. W. F. Allen; le Commandant W. T. Sampson,

Marine des États-Unis; Professeur Cleveland Abbe.
France: M. A. Lefaivre, ministre plénipotentiaire et consul-général; M. Janssen.
Grande-Bretagne: Capitaine Sir F. J. O. Evans, Professeur J. C. Adams, Lieutenant-Général Strachey, M. Sandford Fleming.
Guatémala: M. Miles Rock.
Hawaïï: Hon. W. D. Alexander, Hon. Luther Aholo.
Italie: M. le Comte Albert de Forestá.
Japon: Professeur Kikuchi.
Mexique: M. Leandro Fernandez, M. Angel Anguiano.
Paraguay: Capitaine John Stewart, consul-général.
Russie: M. Charles de Struve, envoyé extraordinaire et ministre plénipotentiaire; Major-Général Stebnitzki; le Conseiller d'État Actuel Kologrivoff.
Saint-Domingue: M. de J. Galvan, envoyé extraordinaire et ministre plénipotentiaire.
Salvador: M. Antonio Batres, envoyé extraordinaire et ministre plénipotentiaire.
Suède: M. le Comte Carl Lewenhaupt, envoyé extraordinaire et ministre plénipoténtiaire.
Turquie: M. Rustem-Effendi.
Vénézuéla: Señor Dr. A. M. Soteldo, chargé d'affaires.

M. RUTHERFURD, délégué des États-Unis, dit que la résolution proposée par lui à la dernière séance ne mentionnait pas que le méridien proposé se référât à la longitude, et qu'il désire en conséquence présenter la substitution suivante:

Résolution: La Conférence propose aux Gouvernements ici représentés d'adopter le méridien passant par le centre de l'instrument méridien de l'Observatoire de Greenwich comme méridien fondamental pour les longitudes.

Le PRÉSIDENT demande alors si la Conférence autorise la substitution; elle est acceptée à l'unanimité.

M. RUTHERFURD, délégué des États-Unis, déclare que son intention n'était pas de demander que la résolution fut l'objet d'un vote à courte échéance, mais qu'il la présentait dans le seul but de provoquer sur ce sujet une expression d'opinion de la part des délégués. Il ajoute qu'ayant entendu dire que les délégués de France, M. Lefaivre et M. Janssen, désiraient présenter certaines propositions, il demandait, pour qu'ils pussent le faire, le retrait temporaire de la proposition qu'il avait lui-même présentée.

Aucune objection n'ayant été soulevée, la résolution est temporairement écartée.

M. LEFAIVRE, délégué de France, fait alors la déclaration suivante:

Notre collègue, M. Rutherfurd, ayant retiré sa proposition d'adopter le méridien de Greenwich, après l'avoir consulté et d'accord avec lui, nous soumettons la motion suivante:

Le méridien initial revêtira le caractère d'une neutralité absolue. Il sera exclusivement choisi dans le but d'assurer des avantages généraux à la science et au commerce international, et spécialement il ne traversera aucun grand continent—ni l'Europe ni l'Amérique.

Sir F. J. O. EVANS, délégué de la Grande-Bretagne, dit alors qu'il ne lui semblait pas que la Conférence put mettre de côté l'importante réunion tenue à Rome, où sur trente-huit délégués, douze étaient directeurs d'observatoires nationaux, et où la question des conditions dans lesquelles devait se trouver un méridien initial avait été discutée

sans tenir compte d'aucune nationalité spéciale; que ces savants en étaient arrivés à cette conclusion (qu'il trouvait fort sage) qu'une des conditions nécessaires pour un méridien initial était qu'il traversât un observatoire astronomique de premier ordre; la science moderne le demandant, ils écartaient en conséquence toute idée d'un méridien placé sur une île, dans un détroit, au sommet d'une montagne ou indiqué par un monument. Après avoir considéré la question sous ses divers aspects, ils en étaient arrivés à cette conclusion qu'il n'existait pas plus de quatre grands observatoires réunissant, à leur point de vue, toutes les conditions nécessaires combinées, et cet avis fut unanimement partagé par la Conférence. Les grands observatoires étaient: Paris, Berlin, Greenwich, et Washington. L'orateur dit ensuite que, tenant compte de ces faits, il lui semblait que la Conférence devait bien se garder, eu égard au point de vue scientifique auquel il était bon de se placer, de s'écarter des conditions établies par la Conférence de Rome; que son désir n'était pas de plaider en faveur de l'un ou l'autre des lieux désignés, mais simplement d'en faire mention comme réunissant toutes les conditions nécessaires à la science, si brillamment représentée à Rome.

M. le Commandant SAMPSON, délégué pour les États-Unis, dit: Je ne puis qu'essayer d'anticiper les arguments que le savant délégué de France va probablement avancer à l'appui de sa proposition pour adopter un méridien neutre. Mais notre devoir le plus simple en notre compétence judiciaire est d'examiner la question d'un premier méridien à tous les points de vue. Dans le but, toutefois, de considérer la question sous un autre point de vue, je fais appel à votre attention pour un moment. Ce Congrès, dans sa dernière séance, par un vote unanime, a déclaré qu'il est désirable d'adopter un premier méridien unique pour compter les longitudes. En outre, il est juste de supposer que les délégués ici assemblés, en réponse à une invitation spéciale du Gouvernement des États-Unis, et pour un but arrêté, ont reçu pleins pouvoirs de leurs Gouvernements respectifs pour agir sur les questions soumises à leur examen dans l'invitation.

A la dernière séance les délégués de France nous ont laissés un peu dans le doute touchant leurs vues sur cette question importante des pouvoirs des délégués, ou du moins, de leur délégation. Mais comme ils ont aujourd'hui défendu l'adoption d'un méridien neutre, nous pouvons en conclure qu'ils possèdent les pouvoirs nécessaires pour considérer pleinement et déterminer la question principale qui nous occupe—le choix d'un premier méridien.

Il nous est permis de supposer, une opinion contraire n'ayant pas été émise, que les délégués de tous les États ici représentés ont été désignés pour "se déterminer sur un méridien initial unique par toute la terre," et pour recommander à leurs Gouvernements respectifs d'adopter ce même méridien.

Et si nous nous entendons tous bien sur la nécessité d'un premier méridien unique, et si nous avons le plein pouvoir de faire notre choix, ce qui en d'autres termes veut dire que nous sommes requis par nos Gouvernements respectifs de faire ce choix, nous pouvons immédiatement procéder à l'exécution de ce devoir.

Dans le choix d'un premier méridien, il n'est point d'accident physique qui se recommande plus qu'un autre comme point de départ; et même la terre ne présente aucune particularité qui puisse être employée comme point initial. Si même les raffinements de la géodésie pouvaient nous mener à la conclusion que la forme de la terre est un ellipsoïde à trois axes, la question de la direction de l'un ou de l'autre des axes équatoriaux serait encore si incertaine que l'extrémité de l'axe ne pour-

rait pas être prise comme point de départ pour compter les longitudes. A vrai dire, comme un méridien doit être avant tout fixe dans sa position, il ne conviendrait pas de faire dépendre sa position d'une constante physique, qui en elle-même est tout au moins incertaine, car de nos jours, tandis que la précision des mesures physiques nous donne des résultats de plus en plus précis, chaque pas vers la précision nécessiterait un changement embarrassant du méridien initial, ou. ce qui s'en suivrait très probablement, on devrait revenir au premier méridien qui perdrait ainsi la dépendance de sa première définition, et deviendrait aussi arbitraire que s'il avait été pris au hasard en premier lieu.

Nous pouvons donc dire qu'à un point de vue purement scientifique, n'importe quel méridien pourrait être pris comme premier méridien. Mais si l'on n'a égard qu'à la commodité et à l'économie, il y a sans aucun doute beaucoup de choix. Considérant cette question de commodités en rapport avec la condition nécessaire de fixité déjà mentionnée, le premier méridien devrait passer par un observatoire national bien établi.

En faisant choix d'un premier méridien qui doit servir pendant une longue période de temps, il est important de le fixer et de le définir de telle sorte que les changements naturels amenés par le temps ne puissent point le rendre incertain. A cette fin, la nation chez laquelle le point sera choisi devrait s'engager à l'établir d'une façon durable et à le protéger contre toutes les causes possibles de changement ou de destruction.

Quand on le considère en rapport avec d'autres exigences qui seront mentionnées ci-après, ce caractère de permanence sera mieux assuré en faisant passer le méridien adopté par un observatoire sous le contrôle du Gouvernement.

Un tel observatoire devrait être en communication télégraphique avec le monde entier, afin que les différences de longitude avec le premier méridien puissent être déterminées en tout lieu. Ces conditions de commodité sont si importantes que l'on peut bien les considérer comme impératives. Pour les remplir, un des méridiens nationaux aujourd'hui employés devrait être choisi. Choisir tout outre qu'un de ces méridiens, ou un méridien dépendant de l'un d'eux, et défini simplement par sa distance angulaire à l'un de ces méridiens nationaux, serait introduire une confusion sans fin dans les cartes marines et géographiques aujourd'hui en usage.

Choisir comme premier méridien un méridien qui sera à une distance angulaire définie d'un des méridiens nationaux, aura pour objet, ou de supprimer quelque inconvénient qui résulte de l'emploi du méridien national lui-même, ou ce sera afin de satisfaire au désir d'ôter toute nationalité au méridien choisi.

On évitera les inconvénients des longitudes est et ouest qui résultent de ce que le premier méridien passe par des contrées très populeuses, en les remplaçant par la longitude continue de 0° à 360°. Et de plus, il y aura un très grand avantage à ce que le premier méridien occupe une position centrale par rapport aux contrées d'une population dense; parce que les distances qui alors sépareront les différents points de l'observatoire central, marquant le méridien initial, seront un minimum, et par conséquent moins sujettes à l'erreur dans la détermination.

Le choix d'un méridien de calcul, et qui serait défini comme étant à un certain nombre de degrès, est ou ouest, d'un des méridiens nationaux, n'ôterait pas au premier méridien son caractère national; car quoique nous puissions calculer la longitude à partir d'un méridien passant par les océans Pacifique ou Atlantique, le point initial duquel toutes les mesures de longitude doivent être faites n'en serait pas moins toujours un des méridiens nationaux. En outre, si tout autre méridien qu'un

des méridiens nationaux ou un méridien dérivé de l'un d'eux était choisi, comme, par exemple, un méridien situé dans le Pacifique ou l'Atlantique, cela nécessiterait un changement dans toutes les cartes marines et géographiques. Il est à peine nécessaire de dire qu'il ne serait d'aucun avantage scientifique ou pratique d'adopter le méridien de la grande pyramide, ou d'essayer d'établir des points méridiens permanents sur une grande étendue dans le méridien choisi, car, même dans l'état avancé de la science astronomique et géodésique, il n'est pas possible d'établir deux points sur le même méridien à une grande distance l'un de l'autre, avec un degré d'exactitude tel qu'il permette de se servir indifféremment de l'un des deux, comme point initial.

A un point de vue d'économie aussi bien que de commodité, le méridien qui est le plus en usage devrait être choisi. Cette condition additionnelle d'économie limiterait notre choix au méridien de Greenwich, car il peut être bien établi sur l'autorité du célèbre délégué du Canada, que plus de 70% de la navigation du monde emploie ce méridien pour ses besoins.

Les cartes marines tracées d'après ce méridien embrassent le monde entier. Le coût des planches sur lesquelles ces cartes sont gravées représente probablement 75% du prix de toutes les planches du monde qui servent à imprimer les cartes marines, et probablement cela ne représente pas moins de dix millions de dollars. Donc, au point de vue de l'économie pour le monde en général, il vaudrait mieux ne pas changer ces planches qui sont gravées pour le méridien de Greenwich, et faire les changements nécessaires aux planches gravées d'après les autres méridiens. Poussées par un orgueil très naturel, les grandes nations ont établi chacune chez elle, par la loi, leur propre méridien, et les États-Unis ont commis cette erreur il y a à peu près 35 ans.

Si l'un de nous hésitait à présent sur l'adoption d'un méridien particulier, ou, si une nation aspirait à l'honneur d'avoir le méridien choisi dans les limites de son territoire, on ne doit pas oublier qu'une fois le premier méridien adopté par tous, il perd son nom spécial et sa nationalité, et devient simplement le premier méridien.

M. RUTHERFURD, délégué des États-Unis, dit que son intention n'était pas de prendre une grande partie du temps dont disposait la Conférence; il avait écouté avec beaucoup de plaisir le profond discours de son collègue, le Commandant Sampson, mais son désir était de dire quelques mots au sujet des conditions de stabilité du méridien initial auxquelles il venait d'être fait allusion. Il désire attirer l'attention sur ce fait que l'Observatoire de Paris est situé au centre d'une ville grande et populeuse; que quelques astronomes français avaient déjà déclaré qu'il ne devrait pas y rester; qu'il était sujet aux trépidations du sol et environné d'une atmosphère impure, obstacles à la plénitude de son utilité; que depuis plusieurs années de grands efforts ont été faits pour transférer l'Observatoire de Paris dans un autre lieu où il pourrait plus librement remplir sa mission, et que la seule cause qui le retienne là où il est, consiste dans le souvenir de son honorable carrière. Il ajoute qu'il est persuadé que personne dans l'assemblée ne manquait de reconnaître les titres qui le distinguent; qu'aucun de ceux ici présents, versés dans l'histoire de l'astronomie, ne manque de considérer avec orgueil les triomphes que l'esprit humain a obtenus dans son enceinte. Mais cependant, dit-il, si un changement doit avoir lieu, si le sentiment fait place aux considérations pratiques, nous trouverons une localité pouvant mieux remplir les conditions nécessaires à un méridien initial. L'orateur continue, et dit que Greenwich est situé au centre d'un grand parc placé sous le contrôle du Gouvernement, d'où

il résulte que rien de nuisible n'en peut approcher sans son consentement, et que cette circonstance est en elle-même un argument; il ajoutera encore un mot sur ce sujet, à savoir, que la Grande-Bretagne n'a pas cherché à faire prévaloir le méridien de Greenwich; qu'elle ne l'a point proposé, mais que'elle a donné son adhésion après que d'autres parties du monde civilisé l'ont désigné.

M. JANSSEN, délégué de France, dit:

L'Observatoire de Paris n'est pas candidat au premier méridien, mais s'il l'était, et qu'on voulut le comparer à celui de Greenwich au point de vue de la précision avec laquelle il est relié actuellement avec les autres observatoires d'Europe, il ne lui serait certes pas inférieur. Les dernières opérations de différences de longitudes par l'électricité, exécutées avec le concours du Bureau des Longitudes de France et de nos officiers de l'État-Major, ont donné des résultats très remarquables, et d'une haute précision: Or, on sait que pour un point de départ de longitudes ce qui importe c'est surtout la précision avec laquelle il est relié à des points, à position parfaitement déterminée, comme sont les grands observatoires. Il y a donc ici de la part de mon éminent collègue une légère confusion, c'est celle de confondre les conditions qui assurent au point de départ des longitudes une liaison exacte par rapport aux observatoires, avec les mérites de la situation astronomique de ce point qui sont ici d'ordre tout à fait secondaire.

M. LEFAIVRE, délégué de France, en réponse, fait l'observation suivante:

Je ne sais si mon observation est fondée, mais il me semble que l'on n'a pas combattu ce que nous avons proposé, on a plutôt parlé en faveur de l'adoption du méridien de Greenwich.

M. RUTHERFURD, délégué des État-Unis, dit que ses observations devaient être simplement considérées comme une négation de la proposition faite par le délégué de France, et non comme des arguments en faveur de l'adoption du méridien de Greenwich.

Le PRÉSIDENT dit qu'il ne considérait pas les observations du délégué des États-Unis comme contraires à l'ordre, attendu qu'elles tendaient à combattre la proposition avancée par le délégué de France.

M. JANSSEN, délégué de France, se lève et prononce le discours qui suit:

MESSIEURS: Dans la dernière séance, et en présence de la proposition qui était faite par mon éminent collègue et ami, M. Rutherfurd, de discuter et de voter sur l'adoption du méridien de Greenwich, comme premier méridien universel, j'ai cru devoir dire que la proposition me paraissait prématurément posée et que nous ne pourrions accepter la discussion dans ces conditions.

M. Rutherfurd a bien voulu me prévenir qu'il retirait momentanément sa proposition pour me permettre de faire porter la discussion tout d'abord sur le principe qui devra présider au choix du premier méridien universel. Je remercie ici M. de Rutherfurd de sa courtoisie et je n'ai plus d'objection à suivre les débats.

Nous demandons, en effet, qu'après la déclaration générale de la dernière séance sur l'utilité de l'adoption d'un premier méridien universel, le Congrès veuille bien discuter la question du principe qui sera admis dans le choix de ce méridien.

Étant chargés, en effet, de soutenir devant vous, messieurs, le principe de la neutralité du méridien initial, il est évident que si ce principe était rejeté par le Congrès il serait inutile pour nous de prendre part à la discussion ultérieure sur le choix du méridien appelé à devenir le point de départ commun des longitudes.

Nous pensons, messieurs, que si cette question de l'unification des longitudes est encore reprise après tant de tentatives infructueuses que l'histoire a enregistrés, il n'y a de chances de succès définitif pour elle, que si on l'asseoit enfin sur des bases d'ordre exclusivement géographique, et qu'il faut écarter à tout prix les compétitions nationales.

Aussi, ne venons-nous pas soutenir ici une candidature, nous nous mettons complètement en dehors du débat, ce qui nous donne une attitude infiniment plus libre pour exprimer notre opinion, et discuter la question au seul point de vue des intérêts de la réforme projetée.

L'histoire de la géographie nous montre de bien nombreuses tentatives d'unification des longitudes, et, quand on recherche les motifs qui ont fait échouer ces tentatives dont plusieurs étaient cependant très heureusement conçues, on est frappé de ce fait qu'ils paraissent dus à deux causes principales: une cause d'ordre scientifique et une cause d'ordre moral. La cause d'ordre scientifique réside dans l'impuissance où étaient les anciens de déterminer exactement les positions relatives de points pris sur le globe; surtout s'il s'agissait d'une île éloignée d'un continent, et qui, par conséquent, ne pouvait être reliée à ce continent par des mesures itinéraires.

C'est ainsi, par exemple, que le premier méridien de Marin de Tyr et de Ptolémée, placé aux îles dites Fortunées, malgré ce qu'il y avait d'heureux dans le choix de sa position à l'extrémité occidentale du monde alors connu, ne put continuer à être employé à cause de l'incertitude du point de départ.

Cet échec très regrettable a fait dévier la question. On fut obligé de revenir sur le continent. Mais alors au lieu d'une origine commune des longitudes, indiquée par la nature, on eut des premiers méridiens de capitale, de lieux remarquables, d'observatoires. La seconde cause à laquelle je faisais tout à l'heure allusion—la cause d'ordre moral, l'amour-propre national—a conduit à multiplier les origines géographiques là où la nature des choses en eut demandé au contraire la réduction à une seule.

Au dix-septième siècle, le cardinal de Richelieu, témoin de cette confusion, voulut reprendre l'idée de Marin de Tyr et assembla à Paris des savants français et étrangers. Le fameux méridien de l'Ile de Fer sortit de leurs conférences.

C'est ici, messieurs, que se trouve un enseignement que nous ne devrions pas perdre de vue. Ce méridien de l'Ile de Fer, qui avait d'abord ce caractère purement géographique et de neutralité qui pouvait seul le rendre et le maintenir comme premier méridien international, fut déplacé de sa position première par le géographe Guillaume Delisle, qui, pour simplifier les chiffres, le plaça à 20° en nombre rond à l'ouest de Paris. Cette simplification malheureuse altérait complètement le principe d'impersonnalité. Ce n'était plus alors un méridien indépendant, c'était le méridien de Paris déguisé. Aussi les conséquences ne tardèrent-elles pas à se faire sentir. Le méridien de l'Ile de Fer, considéré depuis comme méridien purement français, froissa les susceptibilités nationales et perdit ainsi l'avenir, qui lui était certainement réservé, s'il fut resté d'accord avec sa première définition.

Ce fut un véritable malheur pour la géographie. Nos cartes, tout en se perfectionnant, eussent conservé l'unité de départ qui, au contraire, s'altéra de plus en plus.

Ah! si dès que les méthodes astronomiques furent assez avancées pour permettre de fixer des positions relatives avec cette précision moyenne qui est suffisante pour la géographie générale (et ceci pouvait être fait dès la fin du dix-septième siècle) on eut repris l'idée si juste et si géogra-

phique de Marin de Tyr, la réforme eut été réalisée deux siècles plus tôt, et aujourd'hui nous en jouirions pleinement. Mais on commit la faute de perdre de vue les principes mêmes de la question et la fondation des observatoires qui se multiplièrent alors y contribua grandement. Fournissant naturellement des positions relatives très précises, chacun de ces établissements fut choisi par la nation qui le possédait pour lui donner un point de départ de longitudes, en sorte que l'intervention de l'astronomie dans ces questions d'ordre géographique, intervention qui bien comprise pouvait être si utile, nous écarta davantage du but à atteindre.

C'est qu'en effet, messieurs, l'étude des ces questions conduit à établir une distinction très nécessaire entre les méridiens d'ordre géographique ou hydrographique et les méridiens d'observatoire.

Les méridiens d'observatoire doivent être considérés comme essentiellement nationaux. Leur rôle est de permettre aux observatoires de se relier entre eux pour l'unification de leurs observations. Ils servent encore de point d'appui aux travaux géodésiques et topographiques qui s'exécutent autour d'eux. Mais leur rôle d'un ordre tout particulier doit être limité, en général, au pays qui les possède.

Au contraire, les méridiens d'origine, en géographie, n'ont pas besoin d'être fixés avec une précision tout à fait aussi grande que celle réclamée par l'astronomie, mais en revanche leur domaine doit s'étendre au loin, et, tandis qu'il y a intérêt à multiplier le plus possible les méridiens d'observatoires, il y a nécessité de réduire autant qu'on le peut les origines de longitudes en géographie.

On peut dire encore que, si l'emplacement d'un observatoire doit être choisi d'après des considérations d'ordre astronomique, un méridien de départ en géographie ne doit être fixé que d'après des motifs d'ordre géographique.

Messieurs, ces deux rôles si différents, ont-ils toujours été bien compris et a-t-on respecté une distinction si nécessaire? En aucune façon.

Comme les observatoires, en raison des travaux de haute précision qui s'y accomplissent, fournissent d'admirables points de repère, chaque nation qui était en mesure de le faire a rapporté à son observatoire principal, non-seulement les travaux géodésiques ou topographiques qu'elle faisait chez elle, ce qui était bien naturel, mais encore les travaux de géographie ou d'hydrographie générales qu'elle exécutait au loin, méthode qui contenait en germes toutes les difficultés dont nous souffrons aujourd'hui.

Aussi, à mesure que les travaux cartographiques s'accumulaient, le besoin de mettre de l'unité, surtout pour ceux qui concernent la géographie générale, se fit-il de plus en plus sentir.

C'est ce qui explique comment cette question d'un méridien de départ unique a été, dans ces deniers temps, si souvent soulevée.

Parmi les assemblées qui se sont occupées de la question, celle qui doit principalement appeler notre attention est celle tenue à Rome l'année dernière. Pour beaucoup de nos collègues même, les conclusions adoptées par le Congrès de Rome fixent la matière. Ces conclusions doivent donc attirer notre attention d'une manière toute particulière.

Messieurs, en lisant les comptes rendus des séances de cette assemblée, j'ai été frappé de ce fait, que dans une réunion qui comptait tant de savants et de théoriciens éminents, c'est le côté utilitaire de la question qui a été surtout envisagé et qui finalement a dicté le sens des résolutions prises.

Ainsi, au lieu de poser ce grand principe, que le méridien qu'on offrirait au monde comme point de départ de toutes les longitudes terrestres

devait avoir avant tout un caractère essentiellement géographique et impersonnel, on s'est simplement demandé quel était, parmi les méridiens d'observatoires, celui qui, permettez-moi cette expression, avait la clientèle la plus nombreuse.

Dans une question qui intéresse surtout la géographie beaucoup plus que l'hydrographie, comme l'avouent presque tous les marins (à cause qu'il n'existe vraiment que deux méridiens initiaux hydrographiques, Greenwich et Paris), on prend un premier méridien qui règne surtout sur mer. Et ce méridien, au lieu d'être choisi d'après la configuration des continents, est demandé à un observatoire, c'est-à-dire, qu'il se trouve placé sur le globe d'une manière quelconque et très gênante pour la fonction qu'il doit remplir. Enfin, au lieu de profiter des leçons du passé, on introduit dans une question qui doit rallier toutes les volontés, des compétitions nationales.

Eh bien, messieurs, je dis que des considérations d'économie et d'habitudes prises ne devaient pas faire perdre de vue les principes qui doivent dominer la question, et qui seuls peuvent assurer à l'institution son acceptation universelle et sa durée.

Mais il y a plus, ce motif d'économie et d'habitudes prises qu'on invoque comme raison déterminante existe, il est vrai, pour la majorité pour laquelle il a été proposé, mais il n'existe que pour elle seule, et nous laisse tout le poids du changement dans les habitudes, les publications, le matériel.

Puisque le rapport nous trouve si léger dans la balance, permettez-moi, messieurs, de rappeler brièvement le passé et le présent de notre hydrographie, et pour cela je ne puis mieux faire que d'emprunter quelques passages d'un travail qui m'a été communiqué, et émane d'un de nos plus savants hydrographes. "La France," dit-il, "a créé, il y a plus de deux siècles, les plus anciennes éphémérides nautiques existantes. Elle a, la première, conçu et exécuté les grandes opérations géodésiques, ayant pour but la construction des cartes civiles et militaires, la mesure d'arcs de méridien en Europe, en Amérique, et en Afrique. Tous ces travaux étaient et sont réglés sur le méridien de Paris. Presque toutes les tables astronomiques dont se servent aujourd'hui les astronomes et les marines du monde entier sont françaises et calculées pour le méridien de Paris. En ce qui regarde plus particulièrement la marine, les méthodes précises dont se servent aujourd'hui toutes les nations pour les levés hydrographiques sont d'origine française, et nos cartes, rapportées toutes au méridien de Paris, portent des noms tels que ceux de Bougainville, La Pérouse, Fleurieu, Borda, d'Entrecasteaux, Beautemps, Beaupré, Duperrey, Dumont d'Urville, Daussy, pour n'en citer qu'un petit nombre parmi ceux qui ne sont plus.

"Nos collections hydrographiques actuelles comptent plus de 4,000 numéros de cartes. En défalquant celles que le progrès des explorations ne permet plus d'employer, il reste environ 2,600 cartes en usage.

"Sur ce nombre, plus de la moitié représente des levés originaux français, que les nations étrangères ont en grande partie reproduits: parmi celles qui restent, les cartes générales sont le résultat de travaux de discussion faits au Dépôt de la Marine en utilisant tous les documents connus, tant français qu'étrangers, et il y en a relativement peu qui soient la traduction pure et simple de travaux étrangers. Nos levés ne se sont pas bornés aux côtes de la France et de ses colonies; il n'est guère de région du globe pour laquelle nous ne possédions des travaux originaux: Terre-Neuve, les côtes de la Guyane, du Brésil et de la Plata, Madagascar, de nombreux points au Japon et en Chine, 187 cartes originales relatives à l'Océan Pacifique. Nous ne saurions omettre

le beau travail de nos ingénieurs hydrographes sur la côte ouest d'Italie, qui a été honoré par le jury international de la grande médaille d'honneur à l'Exposition Universelle de 1867. L'emploi exclusif par nos marins du méridien de Paris est motivé par les considérations d'un passé deux fois séculaire que nous venons de rappeler brièvement.

"S'il s'agissait d'adopter un autre méridien initial, il faudrait changer la graduation sur les 2,600 planches de notre hydrographie ; il faudrait en faire autant pour nos instructions nautiques, dont le nombre dépasse 600. Ce changement devrait de toute nécessité entraîner dans la connaissance des temps, un changement correspondant."

Voilà des titres qui ont leur valeur. Eh bien! si dans ces conditions la réforme projetée, au lieu de s'inspirer des principes supérieurs qui doivent dominer le sujet, doit prendre uniquement pour base le respect des habitudes prises par le plus grand nombre, et l'absence pour eux de tout sacrifice, en nous réservant à nous seuls le poids du changement et l'abandon d'un passé cher et glorieux, ne sommes-nous pas fondés à dire qu'une proposition qui se formulerait ainsi ne serait pas acceptable?

Quand la France à la fin du siècle dernier institua le mètre, a-t-elle procédé ainsi? A-t-elle par mesure d'économie et pour ne rien changer à ses habitudes, proposé au monde son Pied de Roi? Messieurs, vous savez les faits. La vérité est que chez nous tout a été bouleversé, habitudes et matériel. Et la mesure choisie n'ayant de rapport qu'avec les dimensions de notre globe, est si bien dégagée de toute attache française, que, dans les siècles futurs, le voyageur qui foulera les ruines de nos cités pourra se demander par quel peuple a été inventée la mesure métrique que le hasard pourra amener sous ses pas.

Permettez-moi de dire que c'est ainsi qu'on institue une réforme et qu'on la fait accepter. C'est en donnant soi-même l'exemple du sacrifice; c'est en s'effaçant complètement dans son œuvre qu'on désarme les résistances et qu'on prouve son amour sincère du progrès.

Je me hâte de dire maintenant que je suis persuadé que la proposition votée à Rome n'a été ni faite ni suggérée par l'Angleterre, mais je doute que si elle est agréée elle rende un vrai service à la nation anglaise. Une immense majorité dans les marines du globe navigue avec les cartes anglaises, cela est vrai, et cela est un hommage de fait, rendu à la grande activité maritime de cette nation. Le jour où cette suprématie librement consentie sera transformée en suprématie officielle et imposée, elle subira les vicissitudes de tout pouvoir humain, et cette institution, qui par sa nature est d'ordre purement scientifique, et à laquelle nous voudrions assurer un avenir long et paisible, deviendra l'objet des compétitions ardentes et jalouses des nations.

Tout ceci montre, messieurs, combien il serait plus sage de prendre pour origine des longitudes terrestres un point choisi par les seules considérations géographiques. Sur notre globe, la nature a si nettement séparé le continent où se développe actuellement la grande nation américaine, qu'il n'y a, au point de vue géographique, que deux solutions possibles, toutes deux très naturelles.

La première solution consisterait à revenir, en la modifiant un peu, à la solution des anciens, en plaçant notre méridien vers les Açores. La seconde, de le rejeter dans l'immense nappe d'eau qui sépare l'Amérique de l'Asie, vers ces confins du Nord où le nouveau monde donne la main à l'ancien.

Les deux solutions peuvent être discutées ; elles l'ont été souvent et tout récemment encore par un de nos plus savans géologues, M. de Chancourtois.

Chacun de ces méridiens réunit les conditions fondamentales que la

géographie réclame, et sur lesquelles on s'est toujours accordé quand on a écarté du débat les méridiens nationaux. Quant à la détermination du point adopté, les méthodes astronomiques, aujourd'hui si parfaites, en donneront la position avec un degré d'exactitude aussi grand que la géographie le voudra.

Mais, qu'est-il besoin d'une détermination spéciale et coûteuse de longitude pour un point qui peut être placé arbitrairement, pourvu qu'il reste compris dans certaines limites, comme, par exemple, de satisfaire à la condition de passer par un détroit ou de traverser une île. On peut se contenter de relever le point adopté d'une manière approximative. La position ainsi obtenue sera rapportée à chacun des grands observatoires, bien reliés entre eux, qu'on aura choisis à cet effet, et c'est cette liste de positions relatives qui devient la définition du premier méridien. Quant au signe matériel sur le globe, si l'on en veut un, ce qui n'est nullement nécessaire, il devra être placé conformément à cette définition. On devra le déplacer jusqu'à ce que sa position y soit conforme.

Enfin, si nous examinons la question des changements à introduire dans le matériel cartographique, lesquels dans notre proposition seraient imposés à tout le monde, ils pourraient être fort réduits, surtout si l'on se contentait, ce qui serait suffisant pour les commencements, de ne tracer sur les planches existantes que des amorces d'échelles, qui permettraient déjà de faire immédiatement usage du méridien international. Plus tard, et à mesure qu'on graverait de nouvelles planches, on donnerait une échelle plus complète, mais je crois qu'il y aurait toujours avantage à conserver, à l'exemple de ce qui se fait sur plusieurs atlas, les deux acdres, le national et l'international. S'il est nécessaire aujourd'hui de faciliter les rapports extérieurs, il est bon aussi de conserver chez chaque peuple toutes les manifestations de sa vie personnelle et de respecter les signes qui représentent ses traditions et son passé.

Messieurs, je n'insiste pas sur les détails de l'institution d'un semblable méridien. Nous n'avons à soutenir devant vous que le principe de son acceptation.

Si ce principe était admis par le Congrès nous avons mission de vous dire que vous trouveriez là un terrain d'entente avec la France.

Sans doute, en raison de notre long et glorieux passé, de nos grandes publications, de nos travaux hydrographiques si considérables, un changement de méridien amènerait pour nous des sacrifices lourds et cruels. Cependant, si l'on venait à nous, en nous donnant l'exemple des sacrifices, et en prouvant par là un sincère désir du bien général, la France a donné assez de preuves de son amour du progrès pour qu'on ne puisse douter de son concours.

Mais nous aurions le regret de ne pouvoir nous associer à une combinaion qui, pour sauvegarder les intérêts d'une partie des contractants, sacrifierait le caractère scientifique supérieur de l'institution, caractère indispensable à nos yeux pour lui donner le droit de s'imposer à tous et lui assurer un succès définitif.

M. le Professeur J. C. ADAMS, délégué de la Grande-Bretagne, déclare que s'il lui était permis de soumettre quelques observations relatives à l'éloquent discours prononcé par son collègue, le délégué de France, M. Janssen, il ferait remarquer que, autant qu'il lui a été donné de suivre ce discours, il lui semble qu'il est presque entièrement basé sur des considérations sentimentales; il lui semble que le délégué de France a om un point important que le Président dans son discours d'ouverture clairement établi; à savoir: que l'un des points principaux qu'il y a lieu

de prendre en considération, pour guider les décisions du Congrès, serait de découvrir le moyen d'assurer la plus grande somme d'avantages au monde entier en choisissant un méridien initial entraînant le moins d'inconvénients possible par suite du changement qui aura lieu. Il est évident que tout changement entraînera nécessairement une certaine somme de dérangements, mais le but, à sa manière de voir, était de se préoccuper de ce que dans leur ensemble les dérangements fussent aussi peu considérables que possible.

Le même orateur dit ensuite que si cette circonstance était prise comme base des considérations de la Conférence, il lui semblait que la question se réduirait à agir sur des faits plutôt que sur des sentiments, ces derniers ne pouvant comporter aucune espèce de solution; qu'il était évident que si les délégués ici présents se laissaient guider par des considérations purement sentimentales, ou par des considérations d'amour-propre, la Conférence n'en arriverait jamais à une conclusion, attendu que chaque nationalité mettrait son propre intérêt au niveau des intérêts de toutes les autres nations.

Il ajoute que si la Conférence décide qu'il y a lieu d'adopter un méridien (quant à lui, il ne prétend pas indiquer quel méridien), et que ce méridien pût réunir la plus grande somme d'avantages comparativement aux autres, cette considération devra être prépondérante pour servir de guide à la Conférence; il semble que le délégué de France a omis de présenter, du moins n'a pas mis en évidence, cette considération dans son discours. Les dommages qu'éprouverait une nation par l'adoption d'un méridien neutre nouveau ne seraient pas diminués parce que toutes les autres nations souffriraient les mêmes dommages.

Le Professeur Adams, au sujet d'un méridien neutre, exprime le désir d'appeler l'attention du Congrès sur ce fait, que les délégués ici présents ne forment pas une réunion de belligérants; qu'ils sont neutres, comme doivent l'être des hommes s'occupant d'une question purement scientifique ou de toute autre question ayant trait à la convenance universelle, que la Conférence ne s'est pas réunie à la fin d'une guerre dans le but de déterminer une division de territoire, mais qu'elle s'est réunie amicalement, qu'elle représente des nations amies.

Il espère que les délégués seront, dans leurs décisions, guidés par la considération principale, à savoir: Comment obtenir la plus grande somme de convenances pratiques pour l'univers? Il ne croit pas nécessaire de faire allusion à l'autre partie de l'argumentation qu'il avait cependant d'abord eu l'intention de toucher, car le délégué des États-Unis, M. le Commandant Sampson, ayant pris la parole avant lui, avait si clairement exposé ses vues à la Conférence, que s'y arrêter plus longtemps lui semblait inutile.

Il désire néanmoins ajouter que si la Conférence doit adopter un méridien neutre, il faudra construire un observatoire sur le point que l'on aura choisi, chose qui pourrait présenter beaucoup d'inconvénients, si l'on choisissait un point tel que celui auquel le délégué de France a fait allusion, ou bien si un tel lieu n'est pas choisi on en viendrait à n'avoir qu'un zéro de longitude déterminé par une fiction légale; ce qui ne constituerait pas le moins du monde un zéro réel; qu'il devient donc nécessaire de choisir le zéro en se rapportant à un observatoire connu, et que, par exemple, en supposant que l'on prit pour zéro un point situé à vingt degrés ouest de Paris, il en résulterait évidemment l'adoption de Paris comme méridien initial; il n'en serait pas ainsi nominalement mais bien réellement cependant; il croit que de nos jours il est bon d'écarter les fictions légales et d'appeler chaque chose par son nom.

M. JANSSEN, délégué de France, dit:

L'illustre collègue, dont la présence honore ce Congrès, M. Adams, pense que j'oublie trop le côté pratique de la question: à savoir, comment on peut établir un premier méridien en imposant le moins de changement possible. Il trouve encore que je m'attache trop à ce qu'il appelle une question de sentiment, et termine en émettant l'espoir que toutes les nations mettant de côté les questions d'amour-propre, ne se laisseront guider que par cette considération: Quel est le méridien qui offre les plus grandes convenances pratiques? Voici ma réponse:

Je n'ai pas plus que M. Adams l'intention de placer la question sur le terrain de l'amour-propre. Mais autre chose est de parler au nôm de son amour-propre, ou de prévoir que ce sentiment, qui est très humain, peut se manifester, et qu'on doit écarter les solutions qui peuvent le froisser, parce qu'alors on peut compromettre le succès. C'est toute notre thèse. Et l'histoire même de la grande nation à laquelle M. Adams fait honneur nous fournit des exemples qui ne sont pas dénués de toute signification, puisque le méridien français de l'Ile de Fer ne fut jamais accepté par les Anglais, malgré son heureuse situation géographique, et que nous attendons encore l'honneur de voir le système métrique usuellement employé en Angleterre. Mais laissons ces questions, que je n'aurais pas touchées le premier, et plaçons-nous sur le véritable terrain, celui de l'intérêt de la réforme projetée; c'est le seul digne de nous et de cette discussion.

Nous ne refusons pas d'entrer dans votre concert pour une simple question d'amour-propre, et le tableau des changements et des dépenses que nous aurions à faire pour la réaliser, tableau que j'ai montré il n'y a qu'un instant, est assez éloquent à cet égard.

Mais nous considérons qu'une réforme qui consiste à donner à une question géographique, une de ses plus mauvaises solutions, uniquement pour des convenances pratiques, c'est-à-dire, l'avantage pour vous et vos clients de ne rien changer à votre matériel, à vos habitudes, à vos traditions; nous considérons, dis-je, qu'une telle solution ne saurait avoir l'avenir pour elle et nous refusons de nous y associer.

M. le Professeur ABBE, délégué des États-Unis, est d'avis que le délégué de France, M. Janssen, a saisi la Conférence d'une très-importante proposition; à savoir: que le méridien adopté devrait être neutre. Il ajoute qu'il s'occupe de rechercher le moyen de déterminer ce que peut être un méridien neutre. Sur quel principe la Conférence se basera-t-elle pour établir un méridien neutre, et qu'est-ce qu'un méridien neutre? S'agira-t-il d'un méridien historique, géographique, scientifique ou mathématique? Comment s'y prendra-t-on pour le déterminer? Il jette un regard rétrospectif sur l'histoire d'un important système adopté il y a quelques années. La France entreprit de nous donner un système neutre de poids et mesures, le monde lui en est aujourd'hui reconnaissant. Elle établit que cette mesure neutre devait être la dix-millionième partie du méridien. Elle le détermina par une opération de mesure et aujourd'hui nous nous servons du mètre comme type dans toutes les œuvres importantes de la science; mais ce mètre est-il un système neutre? Notre système métrique est-il neutre? On a eu l'intention de le rendre tel, mais il ne l'est pas; nous employons un système français. Si les Anglais, les Allemands ou les Américains avaient pris la dix millionième partie du quart du méridien, ils auraient obtenu une mesure tant soit peu différente, et l'on aurait eu des mesures anglaises, allemandes et américaines. Nous nous servons du système métrique français. On a eu l'intention d'en faire un système neutre, mais c'est un système français. Nous l'adoptons parce qu'il mérite notre

admiration, mais ce n'est pas un système neutre. Les différentes nations du monde pourraient se réunir et tomber d'accord sur une légère modification de ce système métrique, modification qui serait le résultat de recherches scientifiques collectives, alors le système deviendrait international au lieu d'être français; mais nous ne sommes pas soucieux d'en venir là, nous sommes disposés à adopter un système, nous prenons le type de Paris pour notre type. Comment déterminerons-nous un système neutre de longitude? L'expression "système neutre de longitude" est un mythe, une fantaisie, une œuvre poétique, à moins que vous ne sachiez précisément comment vous y prendre pour le créer. L'orateur voterait en faveur d'un système neutre si les représentants de France pouvaient indiquer clairement à la Conférence le moyen de déterminer que le système est neutre et la convaincre qu'il n'est en aucune façon national.

M. JANSSEN, délégué de France, répondit alors:

Je comprends parfaitement l'objection de mon honorable collègue, le Professeur Abbe. Il demande ce que c'est qu'un méridien neutre, et ajoute que le mètre lui-même ne lui paraît pas une mesure neutre, mais française. Il se fonde sur cette considération que si les Anglais, les Américains, les Allemands en prenant la définition du mètre l'avaient mesuré en particulier, ils seraint arrivés chacun à une mesure différente, ce qui nous aurait donné, dit-il, un mètre anglais, américain, allemand; néanmoins, ajoute-t-il, nous faisons usage du mètre français, à cause de l'admiration qu'il nous inspire.

Je répondrai d'abord ceci: le mètre, en tant que mesure dérivée des dimensions de la terre, n'est pas français, et c'est précisément pour lui ôter ce caractère particulier de nationalité que les instituteurs du mètre ont voulu qu'il découlât de la mesure d'un méridien. Ce qui est français, c'est le mètre particulier de nos archives nationales, lequel présente une très légère différence avec celui que la géodésie actuelle pourrait nous donner. Aussi je pense, que si au moment de la convention du mètre, à laquelle les nations européennes ont coopéré, on avait légèrement retouché à la longueur de notre étalon des archives, pour le mettre en accord avec les mesures qui résultent des travaux géodésiques actuels, on aurait fait une chose essentiellement bonne, afin d'ôter à cette mesure jusqu'à l'ombre d'une attache personnelle. Je suis encore d'accord avec mon honorable collègue, pour trouver que si quelques légères modifications, arrêtées d'un commun accord, peuvent perfectionner le système métrique, nous ne devons avoir, nous Français, aucun motif de nous y opposer. Notre honneur est d'avoir institué tout un système de mesures, qui, n'étant basé que sur des considérations d'ordre scientifique les plus heureusement combinées, peut être accepté par tous. Ainsi, s'il est vrai, que le mètre des archives de Paris est français (non pas d'intention, mais parce qu'il porte le cachet d'une erreur d'origine française), il est international comme mètre, au même titre que la découverte des satellites de Mars, faite par mon ami, M. Asaph Hall, que j'ai le plaisir de voir devant moi, est scientifique et d'ordre universel.

Le mètre, dix-millionième partie de la distance de l'équateur au pôle, n'est pas plus français que cette distance elle-même, et cependant, si les Américains, les Anglais, les Allemands avaient mesuré cette distance ils seraient arrivés chacun à une mesure légèrement différente.

Maintenant, mon honorable collègue ajoute qu'un méridien neutre lui paraît un mythe, une fantasie, une œuvre poétique tant que nous n'aurons pas fixé exactement la méthode pour le déterminer. Je laisse de côté les qualifications que notre honorable collègue introduit dans notre

discussion parce que cette discussion doit rester sérieuse. Il est évident que l'honorable Professeur Abbe n'a pas saisi les explications que j'ai données sur les méthodes propres à déterminer le méridien initial et sur les conditions qui font qu'un méridien peut être considéré comme neutre; mais j'y reviens puisqu'on m'y invite. Notre méridien sera neutre, si au lieu de prendre un de ceux qui sont personnifiés par les grands observatoires existants, auxquels, par conséquent, s'attache le nom d'une nation, et qui par un long usage s'identifient avec cette nation, nous choisissons un méridien en ne nous inspirant que des conditions géographiques de la question et du rôle que nous voulons lui faire jouer.

Voulez-vous un exemple frappant de ce qui différencie un méridien neutre d'un méridien national? Pour sortir de la confusion qui régnait en géographie, au commencement du dix septième siècle, à cause de la multiplicité des premiers méridiens alors employés, un congrès de savants réunis à Paris, par les soins de Richelieu, pour déterminer un premier méridien unique, fixa son choix sur la pointe la plus orientale de l'Ile de Fer. C'était un méridien n'ayant l'attache d'aucune capitale, d'aucun observatoire national, et par conséquent neutre, ou, si vous voulez, purement géographique. Plus tard, le père Feuillet, envoyé en 1724 par l'Académie des sciences pour déterminer la longitude exacte du point initial, ayant donné le chiffre de 19° 55′ 3″ à l'ouest de Paris, le géographe Delisle, pour simplifier, adopta le nombre rond de 20°, et, comme je le disais tout à l'heure, cette altération changea complètement le caractère de ce premier méridien; il cessa d'être neutre et ne devint plus, ainsi qu'on l'a dit avec raison, que le méridien de Paris déguisé. Les Anglais notamment ne l'adoptèrent jamais. Voilà, messieurs, la différence entre un méridien neutre et un méridien de nation.

Et, entre parenthèses, vous voyez, messieurs, combien il est dangereux d'éveiller les susceptibilités nationales dans un sujet d'ordre purement scientifique. Maintenant, vous me permettrez d'ajouter que, si en 1633 on avait su trouver un méridien neutre, un méridien purement géographique, un méridien indépendant, on peut bien le faire, si on en a la bonne volonté, en 1884; et, qu'un point choisi par de pures considérations géographiques, soit vers le détroit de Behring, soit dans le groupe des Açores, pourra être déterminé beaucoup mieux aujourd'hui que ne pouvait le faire le père Feuillet en 1724, et jouer le rôle que le méridien de l'Ile de Fer n'eut pas perdu, s'il n'eut versé dans le méridien de Paris.

M. le Professeur ADAMS, délégué de la Grande-Bretagne, dit qu'il désire seulement faire allusion à un sujet qui a été effleuré par le délégué de la France, M. Janssen, dont il croit l'opinion à peine soutenable; c'est que la question de longitude est une question de géographie purement. Il désire combattre cette opinion, en soutenant que la question de longitude est une question d'observation astronomique pure et simple. La différence des longitudes entre deux lieux ne peut pas être déterminée par des observations géodésiques, parce que, pour faire ceci, il faut faire une hypothèse quant à la figure de la terre, et la figure de la terre n'est pas une figure simple. On peut faire l'hypothèse que la figure de la terre est sphéroïdale, et que le rapport des axes est exactement connu. Cependant, en premier lieu, on n'est pas d'accord sur le rapport exact des axes, ni sur la figure exacte de la terre. Si l'on essaie de mesurer la différence des longitudes entre deux points sur la surface de la terre, surtout quand ces points sont à une distance considérable l'un de l'autre, il faut se fier aux observations astronomiques. Si l'on essaie de déterminer la différence des longitudes par les observations géodésiques, il faut faire l'hypothèse que la figure exacte et les dimensions exactes

de la terre sont connues, et ce n'est pas vrai. La théorie que le premier méridien est une chose de nature purement géographique est sujette à l'objection capitale que la détermination de la différence des longitudes entre deux endroits est réellement la détermination de la différence du temps du passage d'une étoile par le méridien de l'un à l'autre endroit. Voilà qui est bien défini. On observe le passage de l'étoile à un endroit, et l'on observe le passage de l'étoile à l'autre endroit, et par le moyen de la communication télégraphique on est à même de déterminer la différence des longitudes des deux endroits indépendamment de la figure de la terre. Il dit, enfin, qu'il croit que l'honorable délégué de France se trompe sur le point auquel on a fait allusion, si toutefois il a bien compris son discours.

M. JANSSEN, délégué de France, répond :

Je crois que M. Adams se méprend complètement sur ma pensée. Je suis absolument d'accord avec lui pour estimer que la détermination des longitudes ne peut être obtenue, surtout pour des lieux très éloignés, que par les méthodes astronomiques. La géodésie ne peut les fournir que pour les petites distances, il est vrai qu'alors elle les donne avec une exactitude à laquelle les observations méridiennes ne sauraient atteindre. Ainsi, s'il s'agit de déterminer rigoureusement la différence de longitude en temps, de deux lieux sur la terre à très grande distance, c'est en effet une question d'astronomie, parce qu'ici c'est l'astronomie qui donne la solution la plus rapide et la plus exacte. Sous ce rapport, si l'on voulait, par exemple, relier un observatoire déterminé avec un point situé au delà d'un océan, ce serait en effet une question d'astronomie. L'astronomie est ici l'instrument admirable de la solution, mais elle ne doit être que l'instrument.

Au contraire, la question devient géographique, si on se propose de déterminer le point le plus convenable pour y placer l'origine des longitudes terrestres, comme, par exemple, de choisir entre tel ou tel océan. L'astronomie n'a plus rien à faire ici, et quand elle veut nous imposer un de ses établissements pour remplir une semblable fonction, elle tend à fausser la solution. A première vue, on peut croire que toute station peut devenir un point de départ pour les longitudes terrestres; mais, quand on étudie plus profondément la question on voit qu'il peut y avoir de grands avantages à choisir tel point plutôt que tel autre. C'est ainsi que tous les géographes se sont accordés à placer, quand ils l'ont pu, les méridiens de départ dans les océans.

Le Président dit qu'en conformité de la décision du Congrès, il a envoyé aux savants qui ont le droit d'assister aux séances des invitations. Le Président voit ici quelques-uns de ces messieurs, notamment, un des astronomes les plus éminents des États-Unis, à qui ses compatriotes aiment toujours à rendre hommage, M. le Professeur Newcomb, directeur de l'Almanach nautique des États-Unis. Si le Congrès y consent, le Président va inviter M. le Professeur Newcomb à exprimer ses vues sur le sujet en discussion.

Comme il n'y a pas d'objection à la proposition faite par le Président, M. le Professeur NEWCOMB se lève, et dit :

Que par rapport aux observations faites par le délégué distingué de France, M. le Professeur Janssen, il se réserve de revenir sur sa question, si le Congrès veut bien y consentir, puisque le délégué français lui donnera sans doute l'occasion d'étudier ses discours avec plus de soin quand ils seront imprimés.

Il fait observer que M. Janssen a déjà répondu à quelques observations qui ont été soulevées par son argumentation, et il désire maintenant demander plus particulièrement que M. Janssen précise ce qu'il

entend par un méridien neutre; quoiqu'il ait déjà répondu en partie à cette question dans sa réponse au Professeur Abbe; mais qu'il y a un point plus fondamental et pratique, qu'on doit se rappeler à chaque instant, et qui a été soulevé par les remarques de M. le Commandant Sampson, remarques qu'il a écoutées avec un grand intérêt; le Commandant Sampson soutient qu'il faudra avoir un observatoire fixe sur le premier méridien choisi, mais lui (le Professeur Newcomb) ne partage pas cette opinion; il partage, au contraire, jusqu'à un certain point, celle qui a été énoncée sur cette question par M. Janssen.

En choisissant un méridien comme point de départ pour la computation de la longitude, on rencontre ce problème difficile. On a un point sur le globe défini comme premier méridien. Ce point serait pris comme point de départ initial, et on devra déterminer la longitude d'un certain endroit comptée depuis ce point. Maintenant, certainement, il n'y a pas d'autre moyen de faire ceci que d'avoir un instrument astronomique et une communication télégraphique. Sans doute si l'on choisit les Açores ou le détroit de Behring, on ne pourra, ni dans l'un ni dans l'autre cas, élever une lunette méridienne et établir un système de communications télégraphiques avec les stations dont on doit déterminer la longitude. Mais on ne peut faire aucune détermination de longitude d'un seul observatoire fixe en aucun cas.

Il dit ensuite qu'il est absolument impossible d'avoir un premier méridien tout à fait neutre, que la définition du premier méridien doit dépendre, pratiquement, de considérations subsidiaires, n'importe où il pourra être placé. Dans la pratique, en déterminant les longitudes, une communication avec le premier méridien ne peut pas se faire toujours; ce qu'on détermine réellement, c'est une longitude comptée à partir de quelque point intermédiaire, généralement dans le même pays, et en communication télégraphique avec l'endroit dont on désire connaître la longitude. Ce point intermédiaire serait pour le moment le méridien initial pratique. Mais la longitude de ce même point sera toujours incertaine. La science devient toujours plus exacte, et nous trouvons que nous avons tous les jours à corriger la longitude adoptée de notre méridien intermédiaire, et par conséquent de tout point qui dépend de ce méridien.

Comment cette difficulté de changer constamment les longitudes peut-elle être évitée? Il répond que chaque système de longitudes liées doit rester sur sa propre base. Il doit avoir rapport à un premier méridien supposé, et le calcul doit être fait en prenant ce méridien comme point de départ, quand même le résultat se trouve être tant soit peu en erreur. Si un tel système avait été adopté il y a trente ou quarante ans, nous aurions évité la confusion qui provient de la circonstance que les longitudes qui sont données sur beaucoup de nos cartes n'ont aucun rapport à un méridien absolu. Tout ce qui est connu c'est que les astronomes ont déterminé la longitude du lieu et qu'il leur a fallu corriger les cartes convenablement. La longitude d'un lieu a été déterminée en partant de Cambridge, et peut-être y a-t-il dans le voisinage un autre lieu déterminé en partant de l'observatoire de Washington. Nous ne connaissons, ni dans l'un ni dans l'autre cas, rien de la longitude de Cambridge ou de celle de Washington que l'observateur ait supposé dans ses calculs.

Généralement, en déterminant la longitude, le pays adopte l'endroit principal dans ses limites comme premier méridien subsidiaire, et la longitude supposée de ce lieu est nécessairement choisie un peu arbitrairement. La longitude, par exemple, de Washington était connue il y a trente ans comme étant à peu près de 5 heures, 8 minutes et 12

secondes à l'ouest de Greenwich. Si nous avions adopté cette différence par une loi, cela aurait équivalu au choix, pour notre premier méridien, d'un point à 5 heures, 8 minutes et 12 secondes à l'est de Washington, soit que nous nous fussions arrêtés à l'instrument méridien de Greenwich ou non. Ceci aurait fixé une longitude supposée pour l'observatoire de Cambridge et pour les points compris dans le réseau télégraphique. Nous aurions eu un système pratique, pouvant néanmoins avoir besoin d'être corrigé de temps en temps, si quelque légère erreur s'était trouvée dans la longitude supposée. Dans l'état actuel des observations astronomiques, ces petites erreurs n'ont pas d'importance, excepté pour quelques discussions astronomiques très subtiles.

Pour tous les besoins de la géographie et peut-être de la géodésie l'erreur peut être regardée comme zéro, et l'on peut dire par rapport au travail astronomique qu'il sera toujours indépendant de n'importe quel méridien qu'on puisse choisir.

Mais quand même cette difficulté serait évitée, on ne pourrait pas affirmer qu'un endroit quelconque puisse être placé sur un méridien neutre. Supposons, par exemple, qu'on choisisse les Açores, ces îles appartiennent au Portugal; on aura certainement alors un premier méridien portugais, appartenant à la nation portugaise, de sorte qu'on n'aura plus un point neutre, s'il a bien compris ce qu'a dit M. Janssen.

Il dit que le délégué de la Grande-Bretagne, M. le Professeur Adams, a exprimé d'une manière très claire ses idées (celles du Professeur Newcomb) et la difficulté que nous éprouvons à répondre aux exigences des propositions du délégué français; que ce qu'il a dit peut s'appliquer à n'importe quel méridien neutre qui pourra être choisi d'accord avec les plans de M. Janssen. Quelque soit le méridien qu'on choisira, on doit toujours lui supposer un certain nombre de degrés en partant de la capitale du pays où le lieu à déterminer est situé, et alors prendre ce méridien imaginaire au lieu d'un point réel sur la surface du globe.

C'est vrai que ceci est parfaitement praticable, et d'après cette théorie il n'est pas absolument nécessaire d'avoir un observatoire astronomique. Mais pourquoi devons-nous prendre toute cette peine et faire toutes ces dépenses? M. Janssen ne s'est pas expliqué très clairement sur ce point; ses considérations sont purement sentimentales, comme l'a dit le délégué de la Grande-Bretagne, M. le Professeur Adams; quant à lui (le Professeur Newcomb), il ne voit pas quel avantage pourrait résulter du choix d'un méridien neutre au lieu d'un méridien choisi pour des raisons de convenance.

Pour qu'une discussion puisse avoir lieu en bonnes règles, il est nécessaire d'admettre une base qui puisse servir comme point de départ, et il est extrêmement difficile de s'accorder sur une base si l'on introduit des considérations sentimentales parce que de telles considérations sont propres à chaque personne individuellement.

Il désire, par conséquent, proposer encore cette question au délégué de France, savoir: quels avantages pouvons-nous tirer de l'adoption d'un premier méridien neutre?

M. JANSSEN, délégué de France, dit:

L'éminent M. Newcomb me demande de faire ressortir les avantages d'un méridien neutre. Ces avantages sont de deux espèces: ils sont d'ordre géographique et d'ordre moral. Examinons d'abord les premiers. En plaçant ce méridien originel entre l'Asie et l'Amérique on laisse de côté tous les centres habités, ce qui est presque indispensable au point de vue du changement de date. On partage le monde en deux parties: l'ancien continent et le nouveau. De tout temps on a compris l'avan-

tage qu'il y avait à faire passer le premier méridien par l'océan; et c'est justement pour cela que Marin de Tyr au premier siècle l'avait placé aux îles dites Fortunées, à l'ouest du continent africain.

C'est en vain qu'on objecte la difficulté qu'il y aurait à déterminer un pareil méridien. L'astronomie est assez avancée de nos jours pour effectuer cette détermination avec toute la précision désirable.

Quant à la méthode pour obtenir exactement ce méridien, il y en a plusieurs. J'en ai parlé dans mon discours, mais j'y reviens puisqu'on désire plus de détails à cet égard. Ces méthodes se rapportent à deux chefs différents. On peut, et c'est l'idée ancienne, choisir un point physique remarquable, comme, par exemple, l'extremité d'une île, un détroit, le sommet d'une montagne, et déterminer de proche en proche la distance en longitude de ce point aux points de repères, qui sont aujourd'hui les observatoires. Cette méthode, si on exige toute la précision que la science peut atteindre aujourd'hui, serait coûteuse en certains cas. Pour les Açores la dépense serait faible à cause de la proximité des cables; elle serait beaucoup plus forte pour le détroit de Behring. Dans l'hypothèse de l'emploi de cette méthode, il faudrait évidemment placer notre méridien aux Açores.

Dans l'autre méthode, ce n'est pas le point physique qui reste fixe, mais bien la distance de l'origine, une fois admise aux points de repère. Par exemple, admettons que notre méridien initial doit passer comme définition générale par le milieu du détroit de Behring. Pour obtenir sa définition théorique, nous nous procurons un relèvement de ce point, soit par des observations très sommaires de l'ordre des observations hydrographiques, ou bien à l'aide des documens existants; et la longitude ainsi obtenue est rapportée aux observatoires les mieux liés entre eux. Cette liste de longitudes devient la définition de notre méridien et non le point physique qui marque en mer le milieu rigoureux du détroit; si maintenant nous voulons absolument un point physique, nous aurions l'Ile St.-Laurent, qui est coupée vers l'orient par un semblable méridien, et nous pourrions y mettre un point de repère, à condition que la position de ce point serait fidèle à la définition et qu'il soit déplacé, dans un sens ou dans l'autre, jusqu'à ce qu'il y soit conforme. Quant aux très légères erreurs qui peuvent encore affecter les positions relatives des grands observatoires actuellement reliés par l'électricité, elles n'intéressent pas la géographie. Si je ne me trompe, l'éminent directeur du *Nautical Almanack* américain reconnaît qu'on éviterait ainsi les difficultés qui résulteraient de la variation que le perfectionnement de la science amènerait dans l'expression des longitudes avec le temps.

Par là les dépenses seraient nulles ou à peu près.

Par là encore le méridien serait bien neutre et par sa position maritime intercontinentale et par sa définition, puisque le premier chiffre de longitude posé l'aurait été sans s'occuper d'aucun point personnifiant une nation quelconque.

Cet exemple ne répond-il pas aux demandes de M. Newcomb? Je ne l'ai pris qu'à ce titre, car je ne soutiens aucune méthode particulière, mais seulement le principe de neutralité.

Enfin, il faut encore que je revienne sur ces raisons dites sentimentales que mes éminents contradicteurs et amis m'apposent si souvent. Si je ne m'abuse, l'ardeur même de ces beaux débats me démontre que l'honneur de personnifier une belle réforme nous touche plus que nous ne voulons nous l'avouer à nous-mêmes, et que les intérêts pratiques ne sont pas seuls à nous inspirer. M. Adams lui-même en est un exemple, car il doit se rappeler la vive polémique de la presse anglaise et fran-

çaise à l'occasion de la magnifique découverte de Neptune et des droits des deux illustres émules, alors en présence devant l'admiration universelle. Si nous remontons dans l'histoire, ne voyons-nous pas également les amis de Newton et de Leibnitz âprement aux prises à l'occasion de la découverte du calcul infinitésimal? L'amour de la gloire est un des plus nobles mobiles de l'homme, il faut s'incliner devant lui, mais il faut aussi prendre les mesures sages pour ne pas lui laisser donner de mauvais fruits.

Il est si important de ne pas introduire les questions de compétitions nationales dans une réforme scientifique destinée à être acceptée par tous que l'histoire nous montre précisément dans cette question des premiers méridiens des compétitions ardentes. Il fut une époque où presque chaque nation qui avait un grand observatoire avait un méridien, et ce méridien était considéré comme un objet d'orgueil national.

Nous avons eu les méridiens de Paris, de Rome, de Florence, de Londres, etc., etc. Et chacune des nations n'aurait pas consenti à abandonner son méridien pour celui des autres.

Si vous voulez choisir entre Greenwich, Washington, Paris, Berlin, Pulkova, Vienne, Rome, etc., votre réforme pourra être momentanément acceptée, surtout si elle présente des avantages immédiats d'économie, mais elle portera dans ses flancs un vice qui l'empêchera de devenir définitive. Quoique vous fassiez, le méridien qui règlera les longitudes du monde entier restera toujours une couronne aux nombreux prétendants. Placez cette couronne sur la tête de la science et tous s'inclineront.

M. le Commandant SAMPSON, délégué des États-Unis, dit qu'il pensait que Monsieur Janssen, délégué de France, avait entièrement montré tous les avantages d'un méridien commun, mais qu'il avait oublié de mentionner comment déterminer ce méridien. Il ajouta qu'il s'accordait entièrement avec MM. les Professeurs Adams et Newcomb, pour admettre que pour établir un premier méridien il est de toute nécessité de soumettre sa position à un observatoire astronomique. Il ajouta que si un méridien était choisi, passant par le Pacifique ou l'Atlantique, il devrait dépendre d'un point initial dont la longitude fut connue, que la conséquence en serait, que le premier méridien choisi n'en dépendrait pas moins d'un observatoire national, et que choisir un méridien au hasard, sans en référer à aucun observatoire astronomique, conduirait à la plus grande confusion, et, il n'en doute pas, ne serait approuvée par personne.

M. JANSSEN, délégué de France, répondit:

Quand mon honorable collègue, M. Sampson, lira ce que je viens de dire, il verra que j'ai très amplement montré ce qui caractérise un méridien neutre ou d'ordre géographique en opposition aux méridiens de capitale, d'observatoires, qui portent des noms de nations, tandis que les méridiens géographiques portent des noms géographiques, comme, par exemple, les méridiens de l'Ile de Fer, des Açores, du détroit de Behring, etc. Il va sans dire qu'il faut relier le lieu choisi aux observatoires, soit par le calcul, soit d'une manière effective. J'ai dit tout cela avec les détails nécessaires quand j'ai répondu tout à l'heure au Professeur Newcomb.

M. RUTHERFURD, délégué des États-Unis, remarqua alors qu'en addition à tout ce qui avait été dit, il appellerait simplement l'attention sur le fait, qu'après que le point initial serait établi, le méridien cesserait d'être un méridien neutre; que si les Açores sont choisies, elles appartiennent au Portugal, et qu'il ignore absolument l'existence d'une île

dans le Pacifique ayant les conditions requises et n'offrant pas cette même objection ; que peut-être le détroit de Behring, dont M. le délégué français a parlé, serait moins défavorable que tout autre endroit. Il ajouta qu'il est absolument nécessaire qu'il y ait certains moyens de déterminer la différence de longitude entre ce point adopté et d'autres, car autrement on ne pourrait en faire usage. Il nous faut savoir la distance qui existe entre d'autres points et ce premier méridien, et pour cette raison il est nécessaire qu'il soit situé sur la terre ferme. Maintenant, cette terre, devant appartenir à un pays, le méridien cesserait nécessairement d'être un méridien neutre ; enfin il devrait être en communication télégraphique avec tous les observatoires du monde.

M. JANSSEN, délégué de France, répondit alors :

Mon honorable ami, M. Rutherfurd, me dit qu'au moment où l'on choisira le point il cessera d'être neutre. Je lui réponds qu'il confond un principe scientifique avec une question de propriété du sol. Si pour des raisons d'ordre géographique on se déterminait pour un point des Açores, ce méridien serait neutre parce que c'est la science seule qui l'aurait désigné. L'équateur est neutre parce que ce sont les conditions géographiques qui lui assignent ce rôle, et cependant les terres où passe cette ligne ne sont-elles pas possédées par des nations diverses ? Quant à la manière de relier ce premier méridien aux systèmes des observatoires, j'ai expliqué dans mon discours de tout à l'heure comment on pouvait l'obtenir.

M. le Général STRACHEY, délégué d'Angleterre, remarqua alors qu'il avait quelque peu hésité à donner son opinion sur la question, après les discours de tant de personnes, plus à même d'en parler que lui, mais qu'il croyait enfin devoir faire quelques remarques sur la distinction que M. Janssen avait essayé d'établir entre la longitude astronomique et la longitude géographique. Il lui semble à lui qu'une longitude est une longitude. Il est inadmissible que pour les besoins géographiques on ait une longitude de deuxième ou de troisième ordre et pour les besoins astronomiques une longitude de première qualité. Il dit que comme géographe il répudiait une pareille idée. Il est vrai que pour la détermination des longitudes en mer, en n'ayant égard qu'à l'application pratique et maritime, la précision est moins minutieusement requise que pour la détermination des longitudes pour les observatoires astronomiques ; mais après tout, quel est l'objet d'un navire qui désire savoir sa position en mer ? Evidemment d'arriver au port auquel il est destiné, et d'obtenir une détermination de longitude telle que ce navire soit à même d'arriver au port sans danger. Vous obtenez une détermination de longitude comparativement imparfaite, mais elle est suffisamment précise pour vous empêcher d'aller vous jeter sur la terre ferme. Mais comment allons-nous déterminer la longitude d'un port ?

Ce sera certainement, comme on l'a déjà très bien dit, par des observations astronomiques, les seules qui puissent être faites sur terre avec certitude et d'une manière bien déterminée. Conséquemment, il lui semble qu'il est absolument essentiel pour pouvoir fixer un méridien initial pour la détermination des longitudes, de se baser sur des observations faites aux observatoires astronomiques en communication télégraphique les uns avec les autres. Fixer un méridien neutre revient à fixer un méridien idéal réellement basé sur un certain point où se trouve un observatoire. Ceci a été déjà dit deux ou trois fois, et je crois inutile d'amplifier sur ce sujet.

M. JANSSEN, délégué de France, répond alors :

Mon honorable collègue, le Général Strachey, pense que les longitudes

sont des longitudes, et qu'il n'y a pas des longitudes pour l'astronomie et des longitudes pour la géographie. Je réponds que c'est cependant ce que la nature des choses indique. Les longitudes des observatoires, ou plutôt les différences de longitudes de ces établissements, entre eux, doivent être déterminées avec une rigueur qui n'est jamais assez grande. Au Bureau des longitudes de France nous nous occupons de ces différences de longitudes entre les observatoires européens et nous apportons à ces déterminations toute l'exactitude que permet aujourd'hui l'intervention de l'électricité.

La géographie, surtout pour les usages généraux, n'a pas besoin de cette haute précision, qui ne pourrait avoir d'expression sur les cartes; tous les géographes en conviennent. L'expression des longitudes est comme l'expression des poids, comme l'expression des mesures, comme l'expression de toutes choses; son exactitude doit varier suivant l'usage auquel elle s'applique. Est-ce que la pesée nécessaire pour fixer un équivalent en chimie n'est pas d'un tout autre ordre qu'une pesée commerciale? Cependant c'est toujours une pesée. Est-il vraiment besoin d'insister. Mais du reste, ceci n'est qu'une question tout à fait secondaire. Si l'honorable Général Strachey, que j'ai eu le plasir de connaître dans l'Inde, exige que le méridien initial soit relié effectivement avec les observatoires d'une manière très rigoureuse, cela peut être fait si on le veut; les méthodes astronomiques et électriques dont nous disposons le permettent.

M. le Professeur ABBE, délégué des États-Unis. Nous sommes très intéressés dans la détermination, si elle est possible, du caractère d'un méridien neutre. Nous sommes précisément dans les conditions où nous nous trouvâmes il y a bien des années, quand l'Institut de France arrêta que la base du système métrique serait la dix-millionième partie du quart du méridien terrestre. Ayant établi cette base idéale, les hommes de science se dévouèrent des années au travail, et finalement firent légaliser "un étalon métrique" qui est conservé à Paris. Nous avons le même problème à résoudre maintenant. Nous nous occupons en ce moment du projet d'un méridien neutre, et s'il est adopté il nous faudra incorporer dans le système la distance de certaines autres places importantes par rapport à ce méridien. La seule situation suggérée pour le méridien neutre, c'est le détroit de Behring.

Ceci est appelé un méridien neutre parce qu'il se trouve situé entre la Russie et l'Amérique. Mais combien de temps restera-t-il ainsi? Peut-être un an, peut-être deux, peut-être cinquante ans. Qui sait quand la Russie repassera pour reconquérir le pays de ce côté du détroit de Behring? Et qui sait quand l'Amérique ira acheter la moitié de la Sibérie?

En tout cas, ce point là n'est pas cosmopolite, il nous faut trouver quelque chose de fixe, ou dans les sphères de la terre, ou dans les étoiles au-dessus de la terre—quelque chose qui soit au-dessus de toute considération humaine—autrement nous ne réussirons pas à établir un méridien neutre.

M. le Commandant SAMPSON, délégué des États-Unis, manifesta le désir de savoir où M. le Professeur Janssen placerait le méridien neutre.

M. le PRÉSIDENT trouva que le délégué des États-Unis, le Commandant Sampson, faisait là une question qui semblait un peu trop spéciale.

Arrivé à ce point des délibérations, M. le PRÉSIDENT proposa d'arrêter la Conférence pendant quelque temps, afin de permettre aux Secrétaires réguliers, et à lui-même, de se consulter sur la préparation et l'approbation des procès-verbaux, et la proposition fut acceptée.

A la réouverture de la séance, M. JANSSEN, délégué de France, proposa ce qui suit:

La décision sur la motion des délégués français, par rapport au choix d'un méridien neutre, sera remise à la prochaine séance.

Puis il ajouta: Comme j'ai dû parler en français, et que plusieurs de mes collègues n'ont pas pu saisir complètement le sens du discours et des répliques que je viens de prononcer, je demande l'ajournement du vote à la prochaine séance, afin qu'on ait le temps d'imprimer les discours et de les distribuer à nos collègues.

Le PRÉSIDENT dit que s'il comprend bien la proposition, elle signifie que les procès-verbaux de cette séance devront être imprimés et distribués avant le vote.

M. le Commandant SAMPSON, délégué des États-Unis, demande si, dans la supposition qu'on adopte cette proposition, il faudra voter sur la proposition primitive à la prochaine réunion.

Le PRÉSIDENT répond que cela ne sera pas nécessaire; que le délégué de France demande seulement que la proposition ne soit pas mise aux voix aujourd'hui. Cette proposition sera encore à l'ordre du jour, et on pourra la discuter encore à la prochaine réunion, quoiqu'il semble au Président qu'on ferait bien de finir la discussion aujourd'hui, afin que la question puisse être soumise aux délégués à la prochaine séance.

M. LEFAIVRE, délégué de France, dit:

Les considérations qui viennent d'être présentées donnent ample matière aux réflexions. En conséquence, je demande l'ajournement du vote, et j'espère que mes collègues n'y verront pas d'objection.

Le PRÉSIDENT dit qu'il se permettra de proposer que, pour économiser le temps, tous les arguments qu'on aura à produire se produisent maintenant, s'il est possible, afin qu'on puisse les insérér dans le procès-verbal de la séance d'aujourd'hui, qui, sil ne se trompe, sera assez chargé.

RUSTEM-EFFENDI, délégué de Turquie, exprime l'avis que, sans l'aide d'un sténographe français, il sera impossible de dresser convenablement le procès-verbal des séances de cette Conférence; il propose, par conséquent, qu'on fasse venir ce sténographe le plus tôt possible.

Le PRÉSIDENT répond qu'on a déjà fait des efforts pour trouver un sténographe français, mais en vain; si quelqu'un des délégués sait où l'on peut trouver un semblable sténographe et veut bien le faire savoir au Président, celui-ci se fera un plaisir de prendre toutes les mesures nécessaires pour s'assurer de ses services.

M. le Comte LEWENHAUPT, délégué de Suède, dit:

Je propose que la Conférence s'ajourne pour se réunir à l'appel de M. le Président, que l'heure de la prochaine séance soit annoncée aux délégués vingt-quatre heures d'avance, et qu'alors les épreuves du protocole de la présente séance soient en même temps envoyées aux délégués.

Il dit aussi qu'en donnant aux délégués vingt quatre heures après la réception des épreuves, les délégués pourraient faire les corrections, et que les changements pourront être communiqués aux Secrétaires et insérés dans le texte imprimé.

La proposition de M. le Comte Lewenhaupt est adoptée.

La Conférence s'ajourne à cinq heures de l'après-midi pour se rassembler jusqu'à convocation ultérieure de M. le Président.

PROTOCOLE IV.

SÉANCE DU 13 OCTOBRE 1884.

La Conférence se réunit dans la salle diplomatique du Département d'État à une heure de l'après-midi.

Sont présents :

Pour l'Allemagne : M. le Baron von Alvensleben et M. Hinckeldeyn.
Pour l'Autriche-Hongrie : M. le Baron I. von Schæffer.
Pour le Brésil : M. le Dr. Luiz Cruls.
Pour le Chili : MM. F. V. Gormas et A. B. Tupper.
Pour la Colombie : M. le Commodore Franklin.
Pour Costa-Rica : M. J. F. Echeverria.
Pour l'Espagne : M. Juan Valera, M. Emile Ruiz del Arbol, et M. Juan Pastorin.
Pour les États-Unis : M. l'Amiral C. R. P. Rodgers, M. Lewis M. Rutherfurd, M. W. F. Allen, M. le Commandant W. T. Sampson, et M. le Professeur Cleveland Abbe.
Pour la France : MM. A. Lefaivre et Janssen.
Pour la Grande-Bretagne : Sir F. J. O. Evans, M. le Professeur J. C. Adams, M. le Lieutenant-Général Strachey, et M. Sandford Fleming.
Pour le Guatémala : M. Miles Rock.
Pour Hawaïi : l'Honorable W. D. Alexander et l'Honorable Luther Aholo.
Pour l'Italie : M. le Comte Albert de Foresta.
Pour le Japon : M. le Professeur Kikuchi.
Pour la Libérie : M. William Coppinger.
Pour le Mexique : M. Leandro Fernandez et M. Angel Anguiano.
Pour le Paraguay : M. le Capitaine John Stewart.
Pour les Pays-Bas : M. G. de Weckherlin.
Pour la Russie : M. C. de Struve, M. le Major-Général Stebnitzki, et M. J. de Kologrivoff.
Pour Saint-Domingue : M. M. de J. Galvan.
Pour la Suède : M. le Comte Charles Lewenhaupt.
Pour la Suisse : M. le Colonel Émile Frey.
Pour la Turquie : Rustem-Effendi.
Pour le Vénézuéla : M. le Dr. A. M. Soteldo.

Étaient absents :

Pour le Danemark : M. C. S. A. de Bille.
Pour le Salvador : M. A. Batres.

LE PRÉSIDENT. De nombreuses communications ayant été adressées au Président de cette Conférence, lesquelles ont trait aux matières qui l'occupent, le Président demande qu'on nomme un comité auquel puissent être renvoyées toutes les communications de ce genre, et que le dit comité soit chargé de faire le rapport qu'il jugera à propos à leur égard.

M. le Comte LEWENHAUPT, délégué de la Suède. Je demande la permission de proposer à la Conférence que la nomination de cette Commission soit laissée au Président.

M. SOTELDO, délégué du Vénézuéla. J'appuie la proposition du délégué de la Suède.

M. de STRUVE, délégué de Russie. Je partage la même opinion et j'appuie la proposition.

La proposition est adoptée à l'unanimité.

LE PRÉSIDENT. Je nomme comme membres de ce comité M. le Professeur Adams, délégué de la Grande-Bretagne; M. Hinckeldeyn, délé-

gué de l'Allemagne; M. le Professeur Abbe, délégué des États-Unis; M. Kikuchi, délégué du Japon, et M. Echeverria, délégué de Costa-Rica.

LE PRÉSIDENT. Après une discussion de trois heures seulement, cette Conférence s'est ajournée il y a aujourd'hui une semaine, pour se rassembler quand elle serait convoquée par son Président. En l'absence d'un sténographe français, on a tardé beaucoup à dresser le protocole, qui n'est pas terminé. Heureusement on a trouvé un sténographe français expérimenté, grâce à la bienveillante intervention de M. Sandford Fleming, délégué de la Grande-Bretagne, et de M. William Smith, ministre-adjoint de la marine pour la Puissance du Canada. Nous pouvons donc maintenant espérer un compte-rendu assez exact de ce qui sera dit en français, lequel ne demandera que de légères corrections, et le Président espère que les délégués pourront faire leurs corrections *fort* promptement, afin que les protocoles puissent être imprimés et vérifiés le plus tôt possible.

Si quelqu'un des délégués, qui n'ont pas encore parlé, désire adresser la parole à la Conférence relativement à la proposition du délégué de France, on écoutera ce qu'il aura à dire, et lorsque l'auteur de la proposition voudra clore la discussion, on mettra la proposition aux voix, si la Conférence veut bien y consentir.

M. SANDFORD FLEMING, délégué de la Grande-Bretagne. J'ai écouté avec la plus grande attention et avec le plus profond intérêt les observations présentées par les divers orateurs que nous venons d'entendre. J'invoque pour quelques instants votre indulgence afin de faire connaître mon opinion relativement à la proposition de l'éminent délégué de France.

Il me semble que l'importante question soumise à la considération de cette Conférence doit être embrassée de la façon la plus large. Cette question touche à toutes les nationalités; dans l'intérêt commun, nous devons nous efforcer de mettre de côté toutes préoccupations nationales ou individuelles, sous l'influence desquelles nous pouvons nous trouver, et examiner la question avec les sentiments qui animeraient les membres d'une même communauté; en un mot, sous le point de vue de citoyens du monde. Animés d'un esprit aussi large, nous ne saurions manquer d'arriver à une conclusion fructueuse pour l'humanité.

Dans nos délibérations sur le sujet qui nous est présenté, je crois que deux points essentiels doivent être constamment présents à notre esprit:

1°. Nous devons examiner quelle peut être la source des plus grands avantages en général, non-seulement pour le présent, mais pour l'avenir, tout en cherchant à occasionner pour notre époque la plus petite somme d'inconvénients, soit nationaux, soit individuels.

2°. Nous devons, tout en arrivant à une conclusion sur la question principale, objet de la réunion de cette Conférence, ne rien négliger afin d'écarter tout motif de froissement, aujourd'hui ou plus tard, des susceptibilités nationales.

La proposition tend à ce que le choix du méridien initial soit fait en vue de sa neutralité. Ceci implique inévitablement le choix d'un méridien entièrement nouveau, d'un méridien qu'aucune nation n'a jamais employé, attendu que tous les méridiens en usage sont plus ou moins nationaux, et, comme tels, ne sauraient être considérés comme neutres dans le sens et l'intention des honorables délégués de France.

Supposons que la Conférence adopte cette proposition; supposons encore que nous trouvions un méridien absolument indépendant et n'ayant aucune relation avec aucun méridien initial connu; aurions-nous pour cela rempli la tâche pour l'accomplissement de laquelle nous nous sommes réunis? Je le demande; les vingt-six nations représentées

dans cette enceinte accepteraient-elles notre recommendation d'adopter le méridien neutre ? Je crains fort que l'acceptation de cette résolution ne mènerait nullement à la solution de l'importante question proposée à l'examen de la Conférence. Le monde possède déjà au moins onze méridiens différents. L'adoption du nouveau méridien, projeté par les délégués de France, aurait pour résultat, je le crains, d'en augmenter tout simplement le nombre et d'aggraver en proportion la difficulté qu'un si grand nombre de délégués, envoyés de toutes les parties du globe, sont venus écarter.

Tel serait l'effet pratique de l'adoption de la résolution. Si elle produisait un effet, ce serait d'augmenter la difficulté. Je n'ai pas besoin de dire que tel n'était pas le but que se proposaient les divers Gouvernements en envoyant des délégués à cette Conférence. M. le Président a bien justement fait ressortir dans son discours d'ouverture quels seraient les avantages qui résulteraient et les grands dangers qui pourraient parfois être écartés au profit de navires se servant d'un zéro de longitude commun. Outre les bienfaits qui en pourraient résulter pour la navigation, il est, je crois, d'autres avantages également importants qui pourraient naître de nos conclusions à l'égard de la fixation de l'heure.

Il ne me semble pas que l'adoption de la proposition puisse en aucune façon nous conduire au but. Je ne dis pas que le principe d'un méridien neutre soit faux, mais essayer d'en établir un serait, j'en suis convaincu, une mesure qui ne produirait aucun bon résultat. Un méridien neutre est excellent en théorie, mais je le crains; il est absolument en dehors du domaine de la pratique. S'il en est ainsi, il devient urgent de rechercher jusqu'à quel point il serait possible d'obtenir les avantages en vue, en adoptant comme zéro un autre méridien qui, bien qu'en rapport avec un méridien initial connu, ne serait pas de fait un méridien national, et produirait le même résultat qu'un méridien absolument neutre, en ce sens qu'il ménagerait les susceptibilités nationales.

Le choix d'un méridien initial, en rapport avec les méridiens aujourd'hui en usage, ne nous laisse pas dans l'embarras quant au nombre.

Permettez-moi de donner, dans le tableau suivant, la liste des différents méridiens en relation avec le nombre et le tonnage des vaisseaux qui en font usage.

Méridien initial.	Vaisseaux de toutes sortes.		Pour cent.	
	Nombre.	Tonnage.	Navires.	Tonnage.
Greenwich	37, 663	14, 600, 972	65	72
Paris	5, 914	1, 735, 083	10	8
Cadix	2, 468	666, 602	5	3
Naples	2, 263	715, 448	4	4
Christiania	2, 128	695, 988	4	3
Ferro	1, 497	567, 682	2	3
Pulkova	987	298, 641	1½	1½
Stockholm	717	154, 180	1½	1
Lisbonne	491	164, 000	1	1
Copenhague	435	81, 888	1	½
Rio de Janeiro	253	97, 040	½	½
Divers	2, 881	534, 569	4½	2½
Total	57, 697	20, 312, 093	100	100

Il résulte donc que l'un d'eux, le méridien de Greenwich, sert dans la proportion de 72 pour cent. au commerce maritime du globe, et que ensuite les 28 pour cent. qui restent se subdivisent entre dix différents méridiens. Si donc l'on prenait pour base la simple convenance du plus grand nombre, le choix ne serait pas difficile; mais Greenwich est

un méridien national et son emploi comme zéro international éveille des susceptibilités nationales. On peut, néanmoins, écarter en grande partie cette objection en prenant pour zéro de longitude et d'heure le méridien le plus éloigné de Greenwich. Celui-ci se trouvant placé sur le même grand cercle que Greenwich, il ne deviendrait pas nécessaire d'établir un nouvel observatoire; en l'adoptant on ne rendrait nécessaire aucun changement sur les cartes ou tables de navigation si ce n'est l'annotation des longitudes. Il possèderait tous les avantages que l'on attribue au méridien de Greenwich en ce qui concerne la navigation, et, en sa qualité de zéro pour déterminer l'heure, il serait de beaucoup préférable au méridien de Greenwich. Si l'on adoptait ce méridien du Pacifique comme zéro commun, et si l'on comptait constamment la longitude dans une même direction, il ne serait plus nécessaire qu'une nation, quelle qu'elle soit, ait à imprimer sur ses cartes les mots: "Longitude est ou ouest de Greenwich." Le seul mot "longitude" suffirait. Le méridien zéro serait international et nullement national. Même sur les cartes anglaises toute allusion au méridien de Greenwich disparaîtrait.

Un grand nombre d'hommes éminents donnant leur appui à cette façon d'envisager la question, je limiterai à demander qu'il me soit permis de lire l'opinion de M. Otto Struve, directeur de l'Observatoire impérial de Pulkova; il n'existe point de plus haute autorité que celle-là:

Ce méridien a eu pour base, d'un côté, le droit historique de l'Observatoire royal d'Angleterre, droit acquis par les immenses services que cet établissement a rendus pendant deux siècles à la géographie mathématique et à la navigation; d'un autre côté, on a pris en considération que la grande majorité des cartes aujourd'hui en usage sur toutes les mers sont dressées d'après ce méridien; qu'environ 90 pour cent. des navigateurs de longue date sont habitués à prendre leur longitude sur ce méridien. Cependant, une objection à cette proposition consiste en ce que le méridien de Greenwich traverse deux pays d'Europe; il en résulte que la longitude serait calculée par des signes différents dans diverses parties de notre propre continent de même qu'en Afrique.

En outre, le voisinage très rapproché du méridien de Paris, auquel certains géographes français et certains navigateurs d'autres pays s'attachent encore par habitude, par esprit de contradiction ou par rivalité nationale, pourrait facilement amener de tristes accidents.

Pour obvier à ces inconvénients, j'ai proposé de choisir comme méridien initial un autre méridien, situé à un nombre entier d'heures à l'est ou à l'ouest de Greenwich, et parmi les méridiens se trouvant dans cette condition j'ai indiqué, en premier lieu, le méridien proposé aujourd'hui par des savants américains comme réunissant les conditions les plus favorables à son adoption. Il résulte que le méridien situé à 180° de Greenwich offre les avantages suivants:

1. Il ne passe par aucun continent, sauf à l'extrémité est du nord de l'Asie, habitée par un peuple peu nombreux et très peu civilisé, appelé Tschouktschis.

2. Il coïncide exactement avec l'endroit où, d'après un usage établi par une série historique de découvertes maritimes, le navigateur opère le changement de date, différence qui s'opère dans le voisinage d'un certain nombre de petites îles situées dans l'Océan Pacifique, découvertes dans le cours de voyages à l'est et à l'ouest. Il en résulterait que le commencement d'un quantième serait en rapport direct avec celui des heures d'après l'heure cosmopolite.

3. Il n'entraîne aucun changement pour la majorité des navigateurs et des hydrographes, sauf l'addition fort simple de douze heures, ou de 180° à toutes les longitudes.

4. Il n'entraîne aucun changement dans les calculs des éphémérides les plus en usage parmi les navigateurs, à savoir: l'almanach nautique anglais, sauf le changement de midi en minuit et *vice-versâ*. Dans l'almanach nautique américain nul autre changement ne serait nécessaire. Par esprit cosmopolite, et par suite d'une juste appréciation des besoins universels, les excellentes éphémérides publiées à Washington donnent toutes les indications utiles à la navigation en prenant le méridien de Greenwich comme base des calculs.

Ainsi que l'a proposé l'Institut canadien, il se recommande à l'adoption de tous les habitants du monde civilisé en raison de la grande différence de longitude, car il écarte ainsi tout malentendu, toute incertitude touchant la question de savoir s'il y a lieu, quelque soit le cas, de se servir de l'heure cosmopolite ou de l'heure locale.

Pour répondre à la première question posée par l'Institut de Toronto, je recommanderai donc à l'Académie de se prononcer sans hésiter en faveur de l'adoption universelle du méridien situé 180^{c} de Greenwich comme méridien initial du globe.

Ma citation est puisée dans le rapport de M. Otto Struve à l'Académie impériale des sciences, à St.-Pétersbourg, le 30 septembre 1880.

Je présente respectueusement ma façon de penser; nous avons là les moyens de résoudre le problème qui nous a été proposé, sans qu'il soit besoin d'essayer de trouver un méridien tel que celui dont il s'agit dans la proposition des honorables délégués. Quelle que soit son origine, le méridien du Pacifique, auquel j'ai fait allusion, serait bientôt reconnu comme aussi neutre que peut l'être un méridien quelconque. Si, d'un autre côté, nous adoptons la proposition, je crains fort que le but important de cette Conférence ne soit pas atteint et que le règlement d'une question si féconde en avantages pour le monde entier n'en vienne à être indéfiniment ajourné.

M. le Dr. CRULS, délégué de Brésil:

MESSIEURS: Depuis l'ouverture de ces débats des voix plus autorisées que la mienne, entre autres celle de l'honorable M. Sandford Fleming, délégué de l'Angleterre, qui vient de manifester son opinion sur la question, se sont fait entendre sur l'important sujet que nous sommes appelés à discuter et pour lequel nous devons nous efforcer de trouver une solution complète et définitive. Les divers côtés de la réforme projetée—à savoir: l'unification des longitudes, que de multiples intérêts internationaux recommandent à notre sollicitude—me paraissent avoir été envisagés, et c'est ce qui me dispensera de reprendre la question dans ses détails et me permettra d'abréger de beaucoup les quelques considérations que je crois de mon devoir de présenter à la Conférence afin de motiver mon vote.

Jusqu'ici, messieurs, un point, et il est d'une grande importance, est acquis à la discussion, c'est la nécessité d'adopter un méridien initial unique; ce point, en effet, a obtenu l'adhésion de tous les délégués présents à la Conférence. Cette nécessité étant reconnue, il convient de faire un pas de plus vers la solution et de fixer quel sera ce méridien. C'est ce choix, messieurs, qui, en ce moment, fait l'objet de nos débats, et sur lequel nous avons à nous prononcer. Notre honorable collègue, M. Rutherfurd, délégué des États-Unis, a présenté une motion proposant l'adoption du méridien de Greenwich, motion qui se trouve, pour le moment, écartée de nos débats, son auteur ayant bien voulu la retirer temporairement.

La motion qui a été présentée dans la dernière séance, et a fait l'objet de nombreux et intéressants débats, est celle formulée par notre honorable collègue, M. Janssen, délégué de France, qui propose que le méridien adopté ait un caractère neutre et ne rencontre aucun des grands continents d'Europe ou d'Amérique. Cette proposition, messieurs, a été fortement combattue par les délégués d'Angleterre et des États-Unis, et vaillamment soutenue par le délégué de France, et les débats qui s'en sont suivis nous ont donné l'occasion d'assister à un tournoi scientifique du plus haut intérêt. Les orateurs que nous avons eu l'honneur d'entendre me paraissent avoir épuisé toute la série des arguments pour et contre, et, à l'heure qu'il est, je présume que ces débats ont permis à chacun de nous de se faire, en toute connaissance de cause, une opinion sur la question que nous sommes appelés à voter.

Pour ma part, messieurs, je tiens à laisser clairement définie l'attitude que le Brésil, dans mon opinion, a pour mission de prendre au sein de cette assemblée. Cette attitude est d'absolue neutralité, bien-entendu, pour autant qu'il s'agisse de choisir un méridien national, ce qui peut provoquer, chez certaines nations, des compétitions d'amour-propre fort légitimes.

Au point de vue seul des intérêts du Brésil, le choix de tel méridien plutôt que de tel autre ne m'est recommandé par aucune considération. Nos cartes locales sont référées au méridien le plus voisin, celui de l'observatoire de Rio de Janeiro, qui est le point de départ des travaux géodésiques ou hydrographiques en cours d'exécution au Brésil, et qui tous se rattachent à ce même méridien. Les cartes marines de la côte, les plus en usage, sont le résultat des travaux hydrographiques exécutés per le Commandant Mouchez, aujourd'hui amiral et directeur de l'observatoire de Paris. Quant à la détermination télégraphique de la longitude de l'observatoire de Rio, nous la devons à la commission américaine dirigée par le Commandant Green, de la marine des États-Unis.

Maintenant, messieurs, jusqu'au jour où la Conférence s'est réunie pour la première fois, j'avais espéré que ces débats, entrepris sous l'influence d'une généreuse aspiration, et n'ayant pour seul but que d'arriver à établir une mesure dont la nécessité est vivement réclamée par de multiples intérêts de diverse nature, pourraient arriver à une solution complète et définitive. Malheureusement, et je regrette d'être obligé de l'ajouter, les divergences qui se sont manifestées dans le sein de l'assemblée ne permettent guère de l'espérer.

Ce que pour ma part, messieurs, je ne puis pas perdre de vue, c'est qu'il est indispensable que la question, pour laquelle la Conférence se trouve réunie, reçoive une solution complète, sinon, le but du Congrès ne sera pas atteint. Or, puisque les délégués de la France ont manifesté dès l'origine de nos débats leur opposition à l'adoption de tout méridien qui revêtit un caractère de nationalité, ce qui a donné lieu à la motion présentée par M. Janssen, il s'en suit que, toute mesure votée par la Conférence et tendant à l'adoption d'un méridien national, sera, par le fait même de l'abstention de la France, une mesure incomplète et qui ne répondra pas au but que poursuit la Conférence. Je m'empresse d'ajouter, afin d'éviter toute interprétation erronée qui pourrait être donnée à mes paroles, qu'il en serait de même, si, par exemple, le méridien de Paris fût proposé, et que quelque grande nation maritime, telle que l'Angleterre, les États-Unis, ou toute autre, s'abstînt de son adoption; dans ce cas, encore, la mesure votée ne serait pas complète, et, dans ce cas, aussi, ma ligne de conduite serait toute indiquée.

Pour me résumer, messieurs, je dirai que les immenses bénéfices que le monde entier est appelé à recueillir de l'adoption d'un méridien initial unique, ne se produiront dans toute leur plénitude, que pour autant que la mesure soit acceptée par l'unanimité des nations maritimes les plus importantes; dans tout autre cas, j'en suis pour ma part absolument convaincu, la mesure prise sera inefficace en partie, son adoption n'étant pas générale, et tout sera à refaire dans un avenir plus ou moins éloigné. Eh bien, messieurs, les débats auxquels nous avons assisté me prouvent surabondamment qu'il en sera toujours ainsi, aussi longtemps que l'on proposera le méridien de quelque grande nation. En présence, donc, de cette difficulté, qui me paraît insurmontable, la seule solution qui, par sa nature même, ne soulèvera pas les questions brûlantes d'amour-propre national, est celle du méridien ayant un caractère de neutralité absolue. Si l'adoption d'un tel méridien était admise en principe, j'ai la certitude qu'une discussion, entreprise sur le terrain de la science pure, et en se guidant d'après les meilleures conditions qu'il devrait réaliser, conduirait rapidement à une solution pratique.

Dans une telle discussion, messieurs, les arguments qui devraient prévaloir devraient être, avant tout, puisés dans la science, unique source de vérité, la seule qui puisse nous éclairer pour nous permettre

de former un jugement sain, et de prendre une décision basée uniquement sur des considérations d'un ordre purement scientifique.

A côté de ces considérations, je n'ignore pas qu'il y en ait d'autres, je me réfère aux questions économiques, et dont il faut tenir compte; quant aux intérêts politiques, s'il y en a, nos éminents collègues, qui représentent si dignement dans cette assemblée l'élément diplomatique, se chargeraient de les faire valoir, de les défendre, et, grâce à ce concours de lumières, les unes alimentées par la science, les autres par la diplomatie, il y a tout lieu d'espérer que la solution pratique définitive que nous poursuivons ne tarderait pas à jaillir éclatante et visible pour nous tous du sein de nos discussions.

D'ailleurs, messieurs, cette solution pratique me paraît déjà découler de ce que notre honorable collègue, M. Janssen, nous a dit à ce sujet. Le principe du méridien neutre une fois adopté, il resterait à débattre les conditions qu'il devrait remplir et déterminer son emplacement. De deux choses, l'une, ou le méridien sera exclusivement océanique, et, de fait, par sa nature même, il sera alors neutre, ou bien, il coupera quelque île, et, dans ce cas, rien n'empêcherait, par une convention internationale diplomatique, de rendre neutre la parcelle de terre où il conviendrait d'établir un observatoire, lequel pourrait en réalité se borner à bien peu de chose. De ces deux solutions, qui satisfont, l'une et l'autre, aux conditions que doit remplir le méridien, au double point de vue de son caractère de neutralité, et des exigences de la science, je préfère, pour ma part, la seconde. Je me bornerai à signaler par ces quelques mots comment il serait possible d'arriver à une solution pratique, puisque, en ce moment, je n'ai à m'occuper que de l'adoption du principe du méridien neutre.

Je conclus donc, messieurs, en déclarant que je voterai en faveur de l'adoption d'un méridien revêtissant le caractère de neutralité absolue; et, en le faisant, j'espère ainsi contribuer, pour ma part, à ce que nos résolutions soient empreintes du caractère d'indépendance dont elles ont besoin, pour qu'elles puissent d'elles-même, et tout naturellement, s'imposer et se généraliser dans l'avenir, et rallier dès à présent l'adhésion des hommes de science, sans distinction de nationalité, qui, à l'heure qu'il est, attendent nos décisions.

M. JANSSEN, le délégué de la France. Messieurs, j'ai écouté avec beaucoup d'attention le discours du délégué d'Angleterre, M. Fleming, et si nous n'avions pas eu des débats aussi complèts lors de notre dernière réunion, dans laquelle, je crois, toutes les raisons pour et contre ont été données, j'aurais certainement demandé la permission d'y répondre. Mais, je crois que de part et d'autre, nous sommes suffisamment éclairés sur la question, et je désire surtout bien marquer notre intention de ne pas éterniser ce débat. C'est maintenant à vous, messieurs, de décider. Je suis d'autant plus induit à agir, ainsi que mon honorable collègue, le délégué du Brésil, M. le Dr. L. Cruls, qui est astronome comme moi, me paraît avoir résumé la question avec une hauteur de vues et des expressions si heureuses, qu'en vérité, nous pouvons prendre ses arguments comme nôtres.

Mais avant de terminer, je désire remercier mes collègues de la bienveillante attention qu'ils ont bien voulu m'accorder.

Le PRÉSIDENT. La question est maintenant sur la motion présentée par les délégués de la France, dont voici la teneur :

Le méridien initial aura un caractère de neutralité absolue. Il sera exclusivement choisi dans le but d'assurer des advantages généraux à la science et au commerce international, et spécialement il ne traversera aucun grand continent,—ni l'Europe ni l'Amérique.

Le PRÉSIDENT. La Conférence est-elle disposée à voter?

Comme il n'y a pas d'objection, on fait l'appel par nations et on obtient le résultat suivant:

Pour l'affirmative: Brésil, France, Saint-Domingue.

Pour le négative: Allemagne, Autriche, Chili, Colombie, Costa-Rica, Espagne, États-Unis, Grande-Bretagne, Guatémala, Hawaïi, Italie, Japon, Libérie, Mexique, Paraguay, Pays-Bas, Russie, Suède, Suisse, Turquie, Vénézuéla.

Vingt-et-un *non* et trois *oui*.

Le PRÉSIDENT. La proposition est par conséquent rejetée.

M. RUTHERFURD, délégué des États-Unis. M. le Président, en présentant de nouveau la proposition que j'avais retirée pour faire place à la proposition faite par nos collègues de France, ayant suivi les conseils de plusieurs membres de la Conférence que j'ai consultés, je pense qu'il vaut mieux nous fixer sur un système de résolutions qui réponde au mandat qui nous régit.

Dans le but de faciliter l'étude du sujet aux membres de la Conférence, je leur ai fait distribuer des copies de ces résolutions.

Depuis, j'ai entendu dire qu'on a considéré que ces résolutions avaient été communiquées d'une manière irrégulière, c'est-à-dire, que la communication avait été faite d'une façon semi-officielle. Je déclare qu'il n'y a eu aucune intention de ce genre. Il s'agit tout simplement d'un *fait* personnel; mon désir était de faire connaître certaines résolutions, dans le seul but d'en faciliter l'étude préliminaire avant la réunion et d'épargner du temps. J'espère donc que cette explication sera comprise et acceptée.

Ces résolutions sont basées, autant que possible, sur celles qu'on a adoptées à Rome. Elles en diffèrent à deux égards seulement. La Conférence de Rome propose de compter la longitude de l'ouest vers l'est.

Il est à remarquer que je ne trouve aucune discussion sur ce point dans le compte-rendu des débats de la Conférence de Rome. On n'a fait aucune question, et on n'a donné aucune raison à l'appui de cette manière de compter, laquelle, cependant, s'écarte de tout point des usages actuellement suivis. La résolution adoptée par la Conférence de Rome est en substance ceci: On compte la longitude, à partir du méridien de Greenwich, de l'ouest à l'est seulement.

Comme je désirais profiter, autant que possible, des résultats des travaux de la Conférence de Rome, je me suis empressé de consulter mes collègues, ce qui m'a fait voir qu'il existait une grande divergence d'opinions. En premier lieu, quelques-uns ont dit, "nous avons toujours compté la longitude dans les deux sens, c'est à dire, de l'est à l'ouest et de l'ouest à l'est. Faut-il cesser de le faire?" Ceux qui soutenaient que c'était une méthode plus scientifique de compter tout autour du globe, ne s'accordaient pas sur le sens à adopter. Sans vouloir produire des arguments sur la question de savoir laquelle de ces deux méthodes est la meilleure ou la plus commode, je propose de continuer à suivre l'ancienne méthode, et de compter les longitudes en deux sens à partir du méridien initial. Le but de la résolution est de faire coïncider le nouveau jour universel avec le jour civil plûtot qu'avec le jour astronomique. A la Conférence de Rome, on a fait coïncider le jour universel avec le jour astronomique. Il me semble que les inconvénients d'un tel système seraient si grands qu'on devrait hésiter à l'adopter. Pour nous, en Amérique, ces inconvénients ne seraient pas, peut-être, fort graves, mais pour la France et l'Angleterre, et les pays situés près du méridien initial, ils seraient d'une gravité extrême, puisque les heures

du matin seraient d'un jour, et celles de l'après-midi d'un autre. Il me semble que c'est là une objection des plus fortes.

C'était donc simplement pour éviter la difficulté résultant de la proposition de cette résolution. J'espère, cependant, qu'à une époque prochaine tous ces jours en conflit, le jour local, le jour universel, le jourmaritime et le jour astronomique auront un seul et même point de départ. J'ai d'autant plus de raisons de nourrir cette espérance que je me suis mis en rapport avec des personnages distingués ici présents, animé de cet espoir j'ai formulé la résolution pour arriver à ce que le commencement d'une journée fut minuit au méridien initial et non pas midi. A la suite de cette explication, je propose de nouveau l'adoption de la première résolution, qui est formulée comme il suit:

La Conférence propose aux Gouvernements ici représentés l'adoption du méridien passant par le centre de l'instrument méridien de l'observatoire de Greenwich, comme méridien initial de longitude.

M. le PRÉSIDENT. La Conférence a entendu la proposition. La discussion est ouverte.

M. SANDFORD FLEMING, délégué de la Grande-Bretagne. M. le Président, je propose, comme amendement à la résolution qui vient d'être présentée, ce qui suit:

Le méridien propre à servir de zéro commun pour les calculs de longitude et la détermination de l'heure dans le monde entier, soit le grand cercle passant par les pôles et le centre de l'instrument de transit de l'observatoire de Greenwich.

M. le Professeur ADAMS, délégué de la Grande-Bretagne. M. le Président, je désire simplement déclarer, relativement à l'amendement présenté par l'un de nos délégués, que les autres délégués de la Grande-Bretagne ne partagent en aucune façon l'opinion exprimée dans cet amendement et que leur intention est de voter contre dans le cas où il serait mis aux voix.

La proposition de compter la longitude à partir d'un point situé à 180 degrés du méridien de Greenwich ne leur semble posséder aucun avantage. Au contraire, divers inconvénients peuvent en résulter. En adoptant un méridien opposé à celui de Greenwich, vous n'écartez pas la nationalité de ce méridien. Si le méridien de Greenwich est combattu en raison de sa nationalité, le méridien de 180 degrés à partir de Greenwich offre la même cause d'objection. La moitié la plus éloignée est tout aussi nationale que l'autre moitié.

Le PRÉSIDENT dit qu'aucun méridien particulier n'est mentionné dans l'amendement.

M. le Professeur ADAMS, délégué de la Grande-Bretagne. En effet, mais en même temps le méridien décrit est équivoque. C'est le méridien qui passe par les pôles et par le centre de l'instrument de transit de l'observatoire de Greenwich. Tel est le langage de l'amendement. Mais il ne se rapporte qu'à une moitié du grand cercle, passant par les pôles, à la moitié éloignée du méridien plutôt qu'à la moitié la plus rapprochée. A moins que l'amendement ne spécifie quelle est la moitié qu'il faut prendre, il est équivoque et ne comporte pas un vote.

M. MILES ROCK, délégué de Guatémala. M. le Président, il serait peut-être bon que l'on entendit répéter les termes de la résolution première, afin de pouvoir constater clairement le rapport qui existe entre l'amendement et la résolution.

On donne lecture de la résolution primitive présentée par le délégué des États-Unis.

M. le Baron VON ALVENSLEBEN, délégué d'Allemagne. M. le Président, il me semble que dans l'amendement présentée par le délégué de la Grande-Bretagne, les deux questions se trouvent mélangées. La

première chose que nous devons faire, est de déterminer un méridien initial ; la seconde question à décider sera, de savoir s'il y a lieu d'adopter une heure universelle. Si nous adoptons l'amendement dont il s'agit, les deux questions se trouveront englobées dans un seul vote. Je pense donc qu'il serait bon de les séparer, car elles ne sont pas présentées en bonne forme.

M. JUAN VALERA, délégué d'Espagne. Je demande la parole afin d'expliquer mon vote. Le Gouvernement que je représente ici m'a dit d'accepter le méridien de Greenwich comme méridien international pour les longitudes; mais je crois devoir dire, bien que la question ne soit pas soulevée dans ce débat, que l'Espagne fait cette acceptation dans l'espoir que l'Angleterre et les États-Unis accepteront, de leur côté, le système métrique, comme elle l'a fait elle-même. Je ne veux que constater ce fait, et je n'ai pas l'intention d'en faire un sujet de discussion. J'ajouterai seulement que je crois que l'Italie est dans le même cas que l'Espagne.

Le PRÉSIDENT. Nous ferons observer avec toute la déférence due à l'éminent délégué d'Espagne, que la question des poids et des mesures n'est pas de la compétence de cette Conférence. L'invitation faite par le Gouvernement des États-Unis aux nations ici représentés avait un but distinct et spécial, le choix d'un méridien initial, un zéro de longitude dans le monde entier et un type pour la fixation de l'heure. Autant que nous en pouvons juger, il ne serait pas dans l'ordre que cette Conférence entrât dans une discussion sur le système métrique.

M. JUAN VALERA, délégué d'Espagne. Ma seule intention en faisant ces remarques était de constater un fait. Je sais bien que nous n'avons pas à discuter cette question. Au reste, le Gouvernement que je représente exprime seulement un espoir, et je sais que nous n'insérons pas d'espérances dans les protocoles, mais j'ai cru de mon devoir de faire cette déclaration.

M. LEFAIVRE, délégué de France. Je désire faire quelques remarques sur la question lors qu'elle sera mise aux voix. Pour le moment, je ne dirai que quelques mots sur le vote de mon honorable collègue, le délégué d'Espagne, M. Juan Valera.

Je crois que, bien que la question des poids et mesures ne soit pas devant la Conférence, il est permis à un membre d'exposer, au nom de son Gouvernement, les conditions auxquelles son vote a été subordonné. Quand même la question n'est pas sous discussion, il en résulte que le vote est conditionnel au lieu d'être simplement une affirmation. Si mon honorable collègue a reçu de son Gouvernement instruction de subordonner son vote à telle au telle condition, lors même que la question à laquelle il est subordonné n'est pas soumise à la Conférence, il en résulte, suivant moi, et tout le monde admettra, que les conséquences de ce vote sont au moins conditionnelles.

M. JUAN VALERA, délégué d'Espagne. Mon Gouvernement m'a chargé d'exprimer ici son espoir et ses désirs, mais le vote que j'ai donné à mon avis n'est pas conditionnel, car j'avais reçu instruction de prononcer en faveur du méridien de Greenwich pour mesurer les degrés de longitudes ; cependant, il me fallait dire en même temps que c'était dans l'espoir que l'Angleterre et les États-Unis accepteraient les poids et mesures français.

M. le Général STRACHEY, délégué de la Grande-Bretagne. Bien que je partage entièrement la manière de voir de M. le Président sur la question de savoir si cette Conférence a mission de discuter la question des poids et mesures, c'est-à-dire, que nous n'avons pas qualité pour aborder cette question, je suis néanmoins heureux de trouver une oc-

casion de dire que je suis autorisé à déclarer que la Grande-Bretagne a examiné les avis exprimés à Rome, et qu'elle a demandé l'autorisation de se joindre à la Convention *du mètre*. Lors de mon départ d'Angleterre les arrangements étaient terminés, ou en voie de l'être, de sorte qu'il est de fait, que, dorénavant, en ce qui concerne le système des poids et mesures, la Grande-Bretagne se trouvera exactement dans la même situation que les États-Unis.

Dans la Grande-Bretagne l'usage des poids et mesures métriques est autorisé par la loi. Des contrats peuvent être passés dans lesquels ces mesures sont spécifiées, et le département chargé des poids et mesures dans la Grande-Bretagne est en conséquence chargé du soin et du devoir de se procurer des mesures des poids métriques étalons. Il est vrai que le Gouvernement de la Grande-Bretagne n'encourage point un espoir qui pourrait faire présumer que ni pour le présent, et autant que l'on en peut juger ni pour l'avenir, elle adoptera l'emploi forcé du système métrique, mais on sait—et en avançant ce que je vais dire je serai, à n'en pas douter, appuyé par l'opinion des savants éminents, mes compatriotes, ici présents—que les hommes de science en Angleterre sont persuadés que tôt ou tard notre pays adoptera comme les autres le système métrique, système excellent sans doute et fort en usage aujourd'hui pour tout ce qui se rapporte aux fins purement scientifiques.

M. JUAN VALERA, délégué d'Espagne. Je désire remercier l'honorable délégué d'Angleterre, M. le Général Strachey, pour les bonnes paroles qu'il vient de prononcer, et me féliciter moi-même d'avoir manifesté le désir et l'espoir de mon Gouvernement que l'Angleterre acceptât les poids et mesures qui ont été acceptés en Espagne et dans d'autres parties du continent européen.

M. LEFAIVRE, délégué de France. M. le Président, je ne puis pas avoir la prétention d'exposer des suggestions de quelque valeur technique sur la question qui se discute devant vous. Je viens seulement ajouter quelques mots aux considérations qui vous ont été exposées avec tant d'autorité par M. Janssen pour bien mettre en lumière la situation du Gouvernement Français dans cet important débat.

Il est désormais évident, après le débat instructif auquel nous avons assisté, que le méridien de Greenwich n'est pas un méridien scientifique, et que son adoption n'implique aucun progrès pour l'astronomie, la géodésie, la navigation, c'est-à-dire, pour toutes les connaissances ou branches de l'activité humaine intéressés à l'unification que nous avons en vue.

Ainsi, la science est complètement désintéressée dans la candidature que nous discutons. Et je tiens à faire avant tout cette constatation, au moment du vote qui va être pris, et dont nous pouvons prévoir le sens après celui qui a été donné il y a un instant, pour que les dissidents ne puissent pas être accusés de faire obstacle pour des intérêts particuliers aux grandes visées et aux progrès de la science.

S'il ressort, au contraire, une conclusion des débats instructifs auxquels nous avons assisté, c'est que le principal, je dis plus, le seul mérite du méridien de Greenwich—et notre collègue de la Grande-Bretagne nous l'a rappelé tout à l'heure en nous énumérant avec complaisance le tonnage des vaisseaux britanniques et américains—c'est de grouper autour de lui des intérêts respectables, je l'avoue volontiers, par leurs dimensions, leur énergie et leur puissance d'accroissement, mais complètement dépourvus de titres à l'impartiale sollicitude de la science.

Pour renforcer mon assertion, messieurs, je me reporte aux arguments énoncés par M. Hirsch, dans son remarquable rapport à la Conférence

géodésique de Rome, arguments qui ont évidemment entraîné le vote de cette assemblée.

Le méridien de Greenwich, dit ce rapport, correspond à un empire embrassant 20 millions de kilomètres carrés et 25 millions de population. Sa marine marchande qui compte 40,000 navires d'un tonnage de 6 à 9 millions de tonneaux, et un équipage de 370,000 hommes, dépasse en importance l'ensemble de toutes les autres marines. * * * D'autres États, également importants par leur marine marchande, notamment les États-Unis, font usage du méridien de Greenwich.

Eh bien! messieurs, si nous pesons ces raisons, les seules qu'on ait formulées, les seules qui militent encore à l'heure actuelle pour le méridien de Greenwich, n'est-il pas clair que ce sont des suprématies matérielles, des prépondérances commerciales qui vont déterminer votre choix? La science n'apparaît ici que comme l'humble vassale des puissances du jour pour consacrer et couronner leur succès. Mais, messieurs, rien n'est transitoire et fugitif comme le pouvoir et comme la richesse. Tous les grands empires du monde, toutes les prospérités industrielles, commerciales, financières en ont fait l'épreuve tour à tour. Tant qu'il n'y aura pas dans la politique ou le commerce des procédés scientifiques pour fixer, enchaîner la fortune, je ne vois aucune raison de fixer, d'enchaîner, et de subordonner pour ainsi dire la science à leur destinée.

Le caractère de la désignation proposée, le rapporteur à la Conférence de Rome, M. Hirsch, le reconnaît implicitement, car en admettant que l'adoption du méridien de Greenwich est un sacrifice pour la France, il demande que l'Angleterre réponde par une concession analogue "en favorisant l'adoption définitive du système métrique par l'accession à la convention du mètre, et en procurant à tous les États des prototypes métriques rigoureusement comparés." Ainsi, M. Hirsch, dans un esprit d'équité, voulait constituer pour chacun une balance de profits et pertes. Preuve évident qu'il s'agissait d'une question commerciale, et non d'un avantage pour la science.

J'ignore et je n'ai pas mission de dire si le marché eût été accepté par la France. Cependant, c'est avec un grand plaisir que j'ai entendu notre collègue de l'Angleterre déclarer que son Gouvernement était prêt à entrer en pourparlers pour entrer dans la Convention internationale de mètre, mais je constate avec peine que notre situation dans cette Conférence est moins favorisée que dans celle de Rome, puisqu'on nous propose l'abandon pur et simple de notre méridien sans aucune compensation.

A Rome, on mettait en vue l'adoption du système des poids et mesures dont la France a eu la glorieuse initiative, mais ici, on nous invite simplement à sacrifier des traditions chères à notre marine, à notre science nationale, en ajoutant à cette immolation des sacrifices pécuniires.

Nous sommes assurément très flattés qu'on nous attribue assez d'abnégation pour nous élever à ce double héroïsme. Nous voudrions être en état de justifier une opinion aussi flatteuse, et nous voudrions surtout être encouragés par l'exemple. Il y a dans ce moment même de magnifiques transformations à réaliser pour le progrès des sciences et des relations amicales entre les nations: unification des poids et mesures, adoption d'une monnaie commune, et beaucoup d'autres innovations d'une utilité reconnue, infiniment plus pressantes et pratiques que celles des méridiens. Quand le débat sera ouvert sur ces grandes questions, que chaque nation vienne apporter sa part de sacrifices pour ces progrès internationaux. La France, selon son usage, je puis le dire sans gloriole comme sans fausse modestie, la France ne restera pas en arrière.

Pour le moment, nous déclinons l'honneur de nous immoler tout seuls pour un progrès problématique et d'un ordre éminemment secondaire. Et c'est avec une parfaite tranquillité de conscience que nous déclarons ne pas nous associer à l'adoption du méridien de Greenwich, persuadés que la France n'encourt pas le reproche de retarder ou d'entraver la marche de la science en s'abstenant de participer à cette décision.

Le PRÉSIDENT. A moins que quelque autre délégué ne désire parler, l'amendement du délégué de la Grand-Bretagne, M. Fleming, va être mis aux voix.

L'amendement fut alors mis aux voix et rejeté.

M. le PRÉSIDENT. Nous remarquons aujourd'hui la présence au milieu de nous de Sir William Thomson, l'hôte de la Conférence, savant de la plus haute distinction dont le nom est universellement connu et identifié avec des questions analogues à celles que nous sommes appelés à discuter ici. Si la Conférence juge à propos de prier Sir William Thomson de vouloir bien donner un bref aperçu de sa manière de voir, nous serons heureux de lui transmettre cette invitation.

Personne ne s'y opposant, nous avons le plaisir d'inviter Sir William Thomson à prendre la parole.

Sir WILLIAM THOMSON :

M. le Président, Messieurs, je vous remercie de la permission qui m'est accordée d'être ici présent en cette circonstance, et je vous remercie également de me fournir l'occasion d'énoncer mon opinion relativement à la question que vous êtes appelés à discuter. Mon seul désir est que l'aimable permission dont vous m'avez honoré ait sur le succès des travaux de cette Conférence une influence que je ne saurais attribuer aux paroles que je vais prononcer.

La question que vous discutez en ce moment est, si je ne me trompe, une proposition tendant à ce que le méridien passant par le centre de l'instrument de l'observatoire de Greenwich soit adopté comme le méridien initial de longitude; il me semble qu'il s'agit là d'une question pratique; je crois que cette résolution renferme une conclusion pratique telle que le monde s'attend à la voir naître du sein de cette Conférence. On s'attend à ce que les résolutions adoptées auront pour résultat la plus grande convenance générale et non pas la solution d'un problème scientifique. Il s'agit de décider une question dont la nature est celle d'un arrangement d'affaires. Il s'agit de décider quelle sera la combinaison la plus généralement convenable aux intérêts du monde entier.

Il est impossible d'affirmer qu'un méridien est plus scientifique qu'un autre, mais on peut dire qu'un méridien offre plus d'avantages pratiques qu'un autre méridien, et je pense que cette dernière affirmation est éminemment applicable au méridien de Greenwich.

Je forme les vœux les plus sincères et les plus ardents pour que les délégués de France et ceux des autres nations qui ont appuyé de leurs voix la résolution antérieure trouvent le moyen d'adopter la résolution dont la Conférence est actuellement saisie. Il me semble qu'il s'agit là d'un sacrifice, et je suis convaincu que l'honorable délégué de France qui a pris la parole le dernier, M. Lefaivre, saisira bien qu'il ne s'agit point de demander à la France un sacrifice qu'elle ne serait pas disposée à faire.

Dans les admirables discours que M. Janssen a prononcés devant cette Conférence (discours que je n'ai eu ni le plaisir ni la satisfaction d'entendre, mais que j'ai lu avec le plus grand intérêt), il est déclaré que la France est disposée à faire un bien plus grand sacrifice que celui dont il s'agit en ce moment. La somme de sacrifice résultant d'un changement à introduire dans certains usages est toujours plus ou moins consi-

dérable, attendu que l'on ne saurait dire qu'une telle innovation peut se faire sans dérangement; mais il est permis d'avancer que le sacrifice auquel la France est diposée serait bien plus considérable que celui résultant de l'adoption de la résolution dont il s'agit en ce moment.

Si l'on avait adopté la résolution relative à un méridien neutre, toutes les nations eussent été appelées à faire le sacrifice résultant d'un changement de méridien non encore déterminé, et dont les rapports avec les méridiens déjà en usage ne pouvaient être aussi faciles que ceux du méridien de Greenwich avec ces mêmes méridiens. Je suis d'avis que si les délégués de France trouvaient moyen d'adopter cette résolution, ils n'auraient aucun motif de le regretter.

J'approuve hautement ce qui a été dit à l'égard d'un système métrique commun. Mon opinion sur ce sujet est solidement établie, je ne l'exprimerai néanmoins pas si M. le Président croit qu'il y ait un inconvénient à aborder ce sujet; mais il me semble que l'Angleterre fait un sacrifice en s'abstenant d'adopter le système métrique. On ne peut néanmoins pas présenter la question sous cette forme. Nous n'avons pas à considérer ici si l'Angleterre gagnerait ou perdrait en adoptant le système métrique. Telle n'est point la façon d'envisager la question, attendu que l'adoption du système métrique par l'Angleterre est une question restreinte à sa propre convenance à son propre usage; qu'elle l'adopte ou non, sa décision n'affecterait nullement les autres nations. Il n'en résulterait pour d'autres pays ni avantage ni préjudice.

Le PRÉSIDENT. Nous serions bien aise d'entendre l'opinion de Sir William Thomson sur ce sujet s'il était en discussion, mais il ne l'est pas.

Sir WILLIAM THOMSON. Je demande pardon de l'avoir mentionné.

Je n'ai qu'à répéter que l'adoption du méridien de Greenwich est purement de convenance. La différence des autres méridiens à partir de celui-là peut être facilement déterminée, et pour ce motif, je crois que l'adoption générale du méridien de Greenwich entraînerait le minimum de dérangement au monde entier. Ceci exigerait le moins de changements et, en outre, ces changements sont déjà connus.

Je désire demander au Président s'il m'est permis de faire allusion aux résolutions numéros deux et trois qui ont été lues.

Le PRÉSIDENT: Je pense que nous devons nous limiter au sujet qui se trouve actuellement en discussion, à savoir: l'adoption d'un méridien initial.

Sir WILLIAM THOMSON. Alors, il ne me reste qu'à vous remercier, ainsi que messieurs les délégués, de m'avoir permis de prendre la parole et d'exprimer mon entière approbation de la résolution qui a été proposée.

Sir F. J. O. EVANS, délégué de la Grande-Bretagne, fit alors les remarques suivantes:

Considérant les renseignements bien intéressants que M. Janssen a présentés au Congrès sur les travaux hydrographiques de France, passés et présents, et les résultats que représentent aujourd'hui l'ensemble des cartes publiées par les divers Gouvernements, il m'a paru que je devrais, moi—ma position ayant été depuis des années celle d'hydrographe de l'Amirauté de la Grande-Bretagne—et mes collègues partagent pleinement mon opinion, que je devrais, dis-je, mettre à la disposition du Congrès certains faits statistiques qui se rapportent aux grands intérêts de la navigation et du commerce, comme le montre le nombre et la distribution de cartes marines, les renseignements sur la navigation, et les almanachs nautiques publiés par ordre du Gouvernement britannique. Je tiens à ce qu'il soit bien entendu qu'ici je ne veux faire aucune comparaison avec les travaux des autres nations. Je sais bien par ma

propre expérience, que toutes les nations—sauf une ou deux—s'occupent sérieusement, et surtout dans ces derniers temps, du développement de l'hydrographie, et qu'il se pratique incessamment un libre et cordial échange des résultats accomplis.

Avec cette préface, je demande la permission de vous soumettre les exposés suivants, en vous faisant remarquer que les séries de cartes de l'Amirauté embrassent toutes les côtes de toutes les parties navigables du globe.

Le nombre de planches gravées sur cuivre dont on se sert constamment varie de 2,850 à 2,900. Chaque année le nombre s'accroit d'une soixantaine de nouvelles planches qui remplacent un nombre égal d'anciennes.

Le nombre moyen de planches sur cuivre corrigées par an est de 2,700.

Le nombre total de cartes imprimées par an pour l'usage journalier des vaisseaux de la flotte de Sa Majesté et pour la vente au public varie depuis quelques années de 180,000 à 230,000.

La vente au public des cartes de l'Amirauté par l'entremise d'un agent patenté à Londres et dans d'autres ports commerciaux du Royaume se chiffre depuis les sept dernières années, comme suit:

1877	104,562
1878	109,881
1879	103,943
1880	114,430
1881	118,542
1882	131,801
1883	157,325

De ces nombres à peu près le cinquième a été acheté par les Gouvernements ou représentants de l'Autriche, de la France, de l'Allemagne, de l'Italie, de la Russie, de la Turquie, des États-Unis.

La liste ci-jointe, qui m'a été communiquée cette année par l'agent des cartes de l'Amirauté, nous donne les détails les plus précis.

Années.	France.	Allemagne.	États-Unis.	Italie.	Russie.	Turquie.	Autriche.	Totale.
1877	2,039	5,184	2,057	1,518	11,763	.....	.....	22,561
1878	5,741	3,351	2,641	2,645	5,551	.....	600	20,529
1879	3,340	6,425	5,185	802	9,354	.....	641	25,747
1880	5,793	5,280	1,879	797	10,145	519	375	24,788
1881	4,418	3,640	1,273	2,694	3,406	1,160	996	17,587
1882	7,454	5,656	1,716	2,569	4,245	115	1,197	22,952
1883	5,592	7,882	6,174	2,507	6,280	2,368	2,158	32,961
1884 (1er trimestre)	1,367	2,261	2,942	908	2,186	429	577	10,670
	35,744	39,679	23,867	14,440	52,930	4,591	6,544	177,795

Mais les ressources de l'Amirauté britannique destinées aux cartes, bien que grandes, ne suffisent pas aux besoins des vaisseaux de classe inférieure de la marine marchande.

Il y a trois maisons de commerce à Londres qui publient des cartes spéciales, basées néanmoins sur les documents de l'Amirauté, pour satisfaire à cette lacune. M'étant informé, j'ai appris que ces trois maisons publient 640 cartes, qui par leur grandeur demandent environ 930 planches sur cuivre. Je ne suis pas à même de donner les nombres des cartes vendues par ces maisons, mais ils sont grands.

Comme supplément aux cartes de l'Amirauté il y a cinquante-et-un volumes de renseignements sur la navigation. Plusieurs de ces volumes ont plus de 500 pages et ont eu en plusieurs éditions. Des maisons de

commerce publient des renseignements sur plusieurs parties du monde en plus de leurs cartes.

Ces renseignements comprennent les publications sur les régions que l'Amirauté en dépit de tous ses efforts n'a encore pu préparer pour livrer au public.

La vente annuelle des almanachs nautiques pour les sept dernières années :

1877	18,439
1878	16,408
1879	16,290
1880	14,561
1881	15,870
1882	15,071
1883	15,535

Il me semble, Monsieur le Président, que ce sont là des points saillants qui vont aider la Conférence à envisager plus nettement le grand intérêt que la navigation et le commerce ont dans les cartes marines d'un certain pays.

M. W. F. ALLEN, délégué des États-Unis, dit ensuite:

L'établissement d'un premier méridien est devenu, par la force des circonstances, d'une importance pratique pour certaines administrations chargées de grandes responsabilités pour la sûreté de la vie et de la propriété. Ces intérêts ont des relations fort considérables avec le commerce du monde, et surtout avec le commerce intérieur d'un pays ayant une étendue d'environ soixante-cinq degrés de longitude. Une computation exacte du temps est d'une nécessité impérieuse dans la conduite des affaires.

Le 18 novembre 1883, les administrations des chemins de fer des États-Unis et du Canada se sont unies pour l'adoption de l'heure moyenne locale du 75^{me}, du 90^{me}, du 105^{me}, et du 120^{me} méridien à l'ouest de Greenwich comme temps normaux pour le gouvernement de leurs chemins de fer.

Le système qu'ils ont suivi depuis s'est trouvé être satisfaisant. Ils n'ont pas l'intention de faire des changements ultérieurs. Une grande majorité du peuple des différentes régions traversées par les chemins de fer a adopté, pour leur usage locale, par un consentement général ou par une législation spéciale, l'heure normale dont se servent les chemins de fer adjacents.

On a annoncé dans les tableaux des heures publiés à l'usage du public, et dans ceux qui ont été publiés à l'usage des chemins de fer mêmes, que le mouvement des trains est réglé d'après l'heur edu 75^{me} ou du 90^{me} méridien, suivant le cas.

Le département des postes des États-Unis emploie le même système aujourd'hui pour le service des malles. Ce système a remplacé l'ancien où l'on employait exclusivement le temps de Washington.

On voit tout de suite combien il serait inacceptable aux chemins de fer de ce pays, une manière de procéder qui établit le méridien initial de manière que ces méridiens pour la fixation de l'heure normale fussent désignés par des degrés de longitude qui ne fussent pas des degrés exacts. On croit qu'il est plus à désirer que ces méridiens normaux continuent à être désignés comme multiples exacts de 15 degrés, comptés depuis Greenwich. Pour adopter des heures différentes, basées sur des degrés exacts comptés depuis quelque autre méridien initial, il fraudrait une législation spéciale qu'on n'obtiendrait que fort difficilement.

A une réunion des directeurs de plusieurs importantes lignes de chemins de fer qui contrôlent, par le moyen de leurs liaisons, les trois

quarts de tout le réseau des chemins de fer de ce pays, et qui a eu lieu à Philadelphie le 9 octobre 1884, on a pris une décision, dont voici une copie dûment certifiée:

A une assemblée de la convention pour les chemins de fer, tenue à Philadelphie, le 9 octobre 1884, la résolution suivante a été adoptée à l'unanimité:

Considérant qu'une Conférence internationale est maintenant réunie à Washington, D. C., dans le but d'adopter un premier méridien et d'introduire une heure universelle, et

Considérant que les compagnies des chemins de fer des États-Unis et du Canada ont adopté un système d'heures normales, basé respectivement sur les heures moyennes locales du 75me, du 90me, du 105me, et du 120me méridien à l'ouest de Greenwich, et que ce système a été trouvé assez satisfaisant pour rendre inutile et inopportun tout changement ultérieur, par conséquent, cette assemblée décide, que, selon son opinion, le choix de n'importe quel premier méridien qui changerait la dénomination de ces méridiens normaux de manière qu'ils ne fussent plus des degrés exacts mais fractionnaires, occasionnerait des inconvénients graves aux chemins de fer des États-Unis et du Canada;

Qu'une copie, dûment certifiée, de ces décisions soit remise à la Conférence.

P. P. WRIGHT,
Président.

Pour copie conforme:
HENRI B. STONE.

La proposition de M. RUTHERFURD, délégué des États-Unis, est alors mise aux voix. Cette proposition se formule ainsi:

La Conférence propose aux Gouvernements ici représentés l'adoption du méridien passant par le centre de l'instrument méridien de Greenwich, comme méridien initial de longitude.

On procède ensuite à l'appel des différents États:

Pour l'affirmative: l'Allemagne, l'Autriche, le Chili, la Colombie, Costa-Rica, l'Espagne, les États-Unis, la Grande-Bretagne, le Guatémala, Hawaïi, l'Italie, le Japon, la Libérie, le Mexique, les Pays-Bas, le Paraguay, la Russie, la Suède, la Suisse, la Turquie, le Vénézuéla.

Pour la négative: Saint-Domingue.

Se sont abstenus: Le Brésil, la France.

Le résultat fut alors proclamé: Pour la proposition, 21; contre, 1; abstentions, 2.

M. le PRÉSIDENT alors annonça que la résolution était adoptée.

M. DE STRUVE, délégué de Russie, dit: Au nom des délégués de la Russie, je prends, à ce point de la discussion, la liberté de dire quelques mots: S'il ne s'agissait que du côté scientifique des questions, qui ont déjà été discutées et résolues en 1883 à Rome par les éminents savants de divers pays, réunis à la conférence générale de l'Association internationale géodésique, il ne nous resterait qu'à adhérer aux décisions de la Conférence de Rome, et nous nous bornerions à leur donner une forme de projet d'une convention internationale, lequel projet devrait être soumis à l'approbation de nos Gouvernements respectifs. Mais comme nous avons aussi à nous occuper de l'application à la vie pratique des réformes proposées, nous prenons la liberté d'attirer la bienveillante attention de la Conférence sur les points suivants:

Il importe de trouver surtout pour les contrées les plus peuplées, le mode le plus simple de transition du temps local au temps universel et *vice-versâ*, et nous osons croire qu'il serait conforme aux nécessités pratiques de la question d'adopter pour le commencement du jour universel le *minuit* de Greenwich, et non pas le *midi*, sur lequel s'était arrêté la Conférence de Rome.

Cette modification présenterait pour toute l'Europe et pour une grande partie de l'Amérique, en dehors de la facilité de transition du temps local au temps universel, l'avantage d'éviter une double date dans les temps local et universel pendant les heures d'affaires de la journée.

En adoptant le temps universel pour les tables astronomiques et pour les éphémérides, et en faisant coïncider le commencement du jour avec le minuit de Greenwich, on arriverait, il est vrai, à un changement dans la chronologie astronomique en usage jusqu'ici ; mais nous croyons qu'il sera plus aisé pour les astronomes de changer de point de départ et de tenir compte, dans leurs calculs, de ces 12 heures de différence, que ce ne serait le cas pour le public et pour les hommes d'affaires, si le changement de date pour le temps universel devait avoir lieu à midi, et non à minuit.

La Conférence de Rome a adopté pour les longitudes de compter de 0° à 360° dans une direction ininterrompue de l'ouest à l'est, mais ce système, suivant nous, pourrait produire des malentendus dans les chronologies locale et universelle, à l'égard des endroits situés au delà du 180° est de Greenwich. Nous trouvons donc qu'un résultat plus pratique de la réforme serait aisément obtenu, en altérant l'article IV de la résolution de la Conférence de Rome, et en maintenant l'usage depuis longtemps établi, de compter de 0° à 180° à l'est et à l'ouest, en marquant les longitudes de l'est du signe +, et celles de l'ouest du signe —. Dans ce cas le rapport entre le temps universel et locale serait exactemente exprimé par les formules :

Temps universel = temps local — longitude.

L'adoption de ces formules exigerait nécessairement que le changement du jour de la semaine, établi historiquement dans les environs de l'anti-méridien de Greenwich, soit strictement observé et coïncide exactement avec ce méridien.

Nous tenons que le temps universel (article V de la résolution de la Conférence de Rome) soit employé conjointement avec le temps local, pour les échanges internationaux télégraphiques et pour les communications directes internationales par chemins de fer et bâteaux à vapeur.

Nous adhérons complètement à la résolution romaine qui introduit le compte ininterrompu des heures de la journée de 0 à 24 pour l'heure universelle ; et nous nous permettons d'énoncer l'idée, qu'il serait désirable d'adopter avec le temps le même compte pour le calcul des heures dans la vie ordinaire. Cette dernière innovation tendrait à faire disparaître les inconvénients d'une division arbitraire de la journée en deux parties, a. m. et p. m., et faciliterait la transition du temps local au temps universel.

Nous croyons aussi qu'il serait bon de marquer sur les cartes générales les méridiens en temps et en degrés de longitude, ce qui contribuerait à familiariser avec la réforme le public en général aussi bien que la jeunesse des écoles.,

Pour les cartes maritimes, les longitudes, comptées du méridien initial universel, devraient être indiquées en degrés, vu l'importance de ces derniers pour le calcul des distances en milles marins.

Les cartes topographiques, vu les difficultés réelles qu'entraînerait le changement des coordonnées pour les feuilles déjà gravées, pourraient conserver temporairement pour point de départ le méridien national ; mais il faudrait indiquer sur chaque feuille la différence, en degrés de longitude, entre le méridien national et le méridien initial universel.

Il serait fort désirable que dorénavant, dans tous les nouveaux catalogues géographiques, les longitudes des points astronomiques et géodésiques soient exprimées en double, en degrés et en temps ; et que le point de départ des longitudes soit le méridien initial universel.

M. le PRÉSIDENT. Nous avons écouté avec un grand intérêt et un grand plaisir les remarques que M. de Struve, délégué de Russie, vient

de lire, mais nous devons dire qu'aucune résolution n'est soumise à la Conférence.

M. le PRÉSIDENT. Nous allons maintenant passer à la lecture de la deuxième résolution.

La résolution est conçue comme il suit:

De ce méridien, c'est-à-dire, le méridien passant par le centre de l'instrument des passages à l'observatoire de Greenwich, on comptera les longitudes dans deux directions opposées de 0 à 180 degrés; la longitude est sera indiquée par plus (+) et la longitude ouest par moins (—).

M. RUTHERFURD, délégué des États-Unis. En soumettant cette résolution à la Conférence, je dois dire que les remarques du délégué de Russie m'encouragent à persister de croire qu'elle est parfaitement convenable.

M. le Comte LEWENHAUPT, délégué de Suède. M. le Président, je propose comme amendement à la résolution qui vient d'être présentée la quatrième résolution adoptée par le Congrès de Rome:

IV. Il convient de compter les longitudes à partir du méridien de Greenwich dans la seule direction de l'ouest à l'est.

M. le Baron H. VON ALVENSLEBEN, délégué d'Allemagne. M. le Président, je demande simplement à affirmer que je crois ceci une question de détail seulement. Si elle était mise aux voix par la Conférence, je ne pourrai pas voter, et ne voterai pas.

M. le PRÉSIDENT. Pourrais-je demander à M. le délégué d'Allemagne si sa remarque se rapporte à l'amendement.

M. le Baron H. VON ALVENSLEBEN, délégué d'Allemagne. Oui, Monsieur le Président, à l'amendement et à la résolution aussi.

M. le Professeur ADAMS, délégué d'Angleterre. Monsieur le Président, je dois avouer que je suis très porté à penser comme M. le délégué d'Allemagne que ceci n'est qu'une question de détail. Ce n'est qu'une affaire de convenance que nous comptions les longitudes dans une seule direction ou dans deux directions opposées, et que l'on nomme positives celles comptées dans un sens, et négatives celles comptées dans le sens contraire. Ces deux méthodes diffèrent de nom, mais en réalité elles ne présentent aucune contradiction. Dans le calcul mathématique des angles, on peut convenir que l'on comptera de zéro jusqu'à 360° dans une seule direction; mais cela n'empêche pas un mathématicien, s'il trouve cela plus commode dans quelque cas, de considérer comme positifs les angles comptés dans une direction, et comme négatifs ceux comptés dans une direction opposée, si l'on considère les angles comme positifs lorsqu'on les compte vers l'est. Il est conforme à l'usage de les considérer comme négatifs lorsqu'on les compte vers l'ouest. Il est beaucoup plus commode de considérer tous les angles comme positifs dans les tables astronomiques, mais dans d'autres cas, il peut être plus avantageux de les considérer aussi comme négatifs, surtout si vous évitez, par ce moyen, d'employer de grands nombres. Dans des petits pays, comme la Grande-Bretagne, par exemple, il est plus commode pour compter la longitude d'un endroit dans l'ouest de l'Angleterre, de la compter quelques degrés à l'ouest de Greenwich, que 350 et quelques degrés à l'est de ce même méridien.

M. le Commandant SAMPSON, délégué des États-Unis. M. le Président, bien que moi aussi je crois que la question de compter la longitude est une simple affaire de détail, je trouve qu'il est de notre devoir de la décider d'une manière ou d'une autre. Les navigateurs sont plus intéressés dans cette question que les mathématiciens, et les longitudes doivent être inscrites sur nos cartes hydrographiques. Or, comme

le savant délégué de la Grande-Bretagne, M. le Professeur Adams, qui vient de parler, a déclaré que le principe dont il est question est le même que l'on compte à l'est ou à l'ouest, ou que l'on compte d'un bout à l'autre dans la même direction. Il me semble pourtant que, lorsqu'on considère le calcul de la longitude en rapport avec l'adoption d'un jour universel, cela devient un choix décisif en faveur du calcul de la longitude de 0° à 360°, si nous adoptons la résolution qu'à émise le délégué des États-Unis, M. Rutherfurd, ce sera en parfaite conformité avec les habitudes du monde. Pour cette raison, et c'en est une excellente, je trouve qu'elle pourrait être adoptée; mais un peu de réflexion montrera que si nous comptons la longitude de 0° à 360° de l'est à l'ouest, alors nous changerons l'usage existant du monde, par rapport au calcul de la longitude, naturellement, pour un hémisphère seulement, et cela sera à l'est du premier méridien; mais comme nous nous rappellerons tous qu'à l'est du premier méridien se trouvent les contrées les plus importantes de l'Asie, de l'Europe et de l'Afrique, ainsi que presque dans toutes les eaux navigables qui se trouvent dans l'autre hémisphère, la longitude continuera à être comptée comme maintenant. Pour les navigateurs des eaux qui se trouvent à l'est du premier méridien il y aura ce changement dans la méthode de compter la longitude.

A présent, si nous adoptions la méthode de compter la longitude des deux côtés, il serait nécessaire d'adopter deux règles différentes pour convertir l'heure locale en heure universelle.

M. le Professeur ADAMS, délégué de la Grande-Bretagne. Oh, non, pas le moins du monde.

M. le Commandant SAMPSON, délégué des Étas-Unis. Car bien qu'une formule suffise en tenant compte du signe algébrique touchant la longitude, il ne faut pas oublier que la formule doit être employée par des personnes qui ne sont pas habituées à indiquer les longitudes de l'est ou de l'ouest par des signes différents, et qui, en conséquence, requerront une formule pour la longitude occidentale et une autre pour la longitude orientale.

Si, au contraire, nous adoptons la méthode de compter de 0° à 360° de l'est à l'ouest, le rapport qui existe entre l'heure locale et l'heure universelle devient aussi simple que possible. Pour obtenir la date et l'heure universelles, dans ces circonstances, il ne faut qu'ajouter la longitude à l'heure locale. Par temps locale on entend la date locale et l'heure locale.

Je crois donc pour cette raison qu'il serait préférable de compter la longitude dans une seule direction de l'est à l'ouest au lieu de l'ouest à l'est.

Sir FREDERICK EVANS, délégué de la Grande-Bretagne. Je voudrais dire quelques mots en faveur des marins. L'amendement introduit un changement important. Dans la résolution qui fait l'objet de notre discussion, il n'est simplement question que de compter la longitude comme le font les marins de toutes les nations, et je crois qu'il serait bien de ne pas confondre ce point avec celui de l'heure universelle.

M. le PRÉSIDENT. Je ferai remarquer que la discussion doit se limiter à l'amendement du délégué de la Suède, M. le Compte Lewenhaupt, c'est-à-dire, l'adoption de la IV^e^ résolution du Congrès de Rome.

Sir FREDERICK EVANS, délégué de la Grande-Bretagne. Je pense encore que dans l'intérêt des navigateurs il n'est pas à souhaiter que l'amendement soit accuelli. Il faut nous souvenir qu'une part immense du trafic du monde se fait uniquement par mer autour du globe, et que proposer la désorganisation du système employé par les marins, le calcul des longitudes dans une seule direction leur serait, tout au moins, très

incommode, et je crois qu'il leur faudrait beaucoup de temps pour s'habituer à le faire. Je pense cependant que pour ce qui est de l'heure, les avis ne diffèreraient point. C'est évidemment la méthode la plus facile, mais comme nous devons rechercher le côté pratique dans les calculs de longitudes, je me vois obligé à ne pas être d'accord avec l'amendement, je donnerai mon vote en faveur de la résolution primitive.

JUAN PASTORIN, délégué d'Espagne, présente alors l'amendement suivant:

La Conférence propose aux Gouvernements ici représentés que la longitude soit comptée à partir du méridien initial vers l'ouest en direction inverse de la rotation terrestre et calculée de zéro degré à 360 degrés et de zéro heure à 24 heures.

Le PRÉSIDENT. La question soumise à la Conférence porte maintenant sur l'amendement de M. le délégué de Suède. Si M. le délégué d'Espagne désire présenter sa résolution comme amendement à l'amendement déjà proposé, nous le soumettrons à la Conférence.

M. JUAN PASTORIN, délégué d'Espagne. Je partage la manière de voir exprimée par notre collègue, M. le Commandant Sampson, et je présente la résolution que je viens d'énoncer.

M. VALERA, délégué d'Espagne. Je crois que mon collègue, le délégué d'Espagne, M. Juan Pastorin, propose un amendement qui ne s'applique pas à la motion qui nous est maintenant soumise, mais à la motion primitive. Afin d'éviter toute ambiguité, il serait beaucoup mieux de discuter ces questions les unes après les autres. Ainsi, nous pouvons décider la question de savoir s'il est mieux de compter 180 degrés de chaque côté, ou 360 degrés de suite; ensuite, nous passerons à autre chose.

Le PRÉSIDENT. Dans le but de tomber d'accord avec le délégué d'Espagne, M. Valera, M. Pastorin retirera son amendement, et le délégué de Suède, M. le Compte Lewenhaupt, modifie la résolution qu'il a déjà présentée afin qu'on puisse l'examiner en détail.

M. JUAN PASTORIN, délégué d'Espagne. En conformité avec ce que vient de dire M. le Président, je retire mon amendement.

M. le Comte LEWENHAUPT, délégué de Suède. Qu'il me soit permis de présenter les propositions suivantes sous forme d'amendement à la résolution originale présentée par le délégué des États-Unis:

Ces propositions distinctes les unes des autres seront discutées successivement:

1. Les longitudes seront comptées à partir de ce méridien initial (le méridien de Greenwich), dans une seule direction.
2. Les longitudes seront comptées de l'ouest à l'est.
3. (A défaut de 2.) Les longitudes seront comptées de l'est à l'ouest.

Le PRÉSIDENT. Les délégués de Suède et d'Espagne sont tombés d'accord sur la première partie de la résolution, à savoir, que la longitude sera comptée dans une seule direction, c'est-à-dire, de zéro à 360 degrés. La question soumise à la Conférence porte sur cette résolution, et les deux autres seront discutées ensuite.

M. le Général STRACHEY, délégué de la Grande-Bretagne. Il me semble impossible de procéder à un vote sur ces propositions sans prendre en considération ce qui sera décidé relativement au jour universel. Ce jour, il me semble, devra être déterminé en égard au méridien initial du monde, de façon à éviter autant que possible les inconvénients qui résulteraient d'une interruption de date et d'heure locale en passant autour du globe. De quelque manière que l'on s'y prenne pour calculer la longitude, il faut en arriver à l'inévitable interruption sur un point quelconque du grand cercle de la terre.

Il me semble que la meilleure manière de compter, et la longitude et l'heure, est de faire en sorte que l'interruption se produise sur le même point du globe. Or, il est évident, ainsi qu'on en a fait l'observation à Rome, l'inconvénient sera bien moindre si l'interruption de date s'effectue sur le méridien de 180 degrés de Greenwich. Alors le calcul de l'heure autour du globe, allant de l'ouest à l'est dans la direction de la rotation terrestre, devient continu.

Toute autre méthode d'opérer, autant que je puis m'en rendre compte, produira une interruption à un point quelconque de la partie habitée de la terre. Si l'interruption avait lieu à Greenwich, ainsi que la proposition en a été faite à la Conférence de Rome, les dates seraient changées en Europe. Chose qui, à mon sens, serait extrêmement désagréable.

Afin d'apporter l'harmonie dans ce que j'ai appelé interruption de date, c'est-à-dire, interruption dans le calcul de la longitude, je crois qu'il serait mieux de calculer la longitude dans les deux directions. Il n'y aura alors point d'interruption sauf sur le méridien actuel. Il en résulterait une grande difficulté pour une grande partie du monde civilisé si la résolution qui vient d'être présentée arrivait à être adoptée.

En somme, à quoi doivent tendre nos efforts? Malgré ce qui a été dit à l'encontre, pour ma part je dois dire que le but important à poursuivre ici est d'assurer la plus grande somme d'avantages au monde civilisé, et il me semble que nous devrions essayer d'y arriver.

A moins qu'il n'existe un très puissant motif de changer le système actuellement en usage pour compter la longitude, je crois que ceci est une excellente raison pour le maintenir. Je ne vois pas de but pratique pouvant conduire à un avantage résultant du calcul des longitudes de zéro à 360 degrés. Il peut exister une fin scientifique pour laquelle cette méthode offrirait un avantage, mais le but que cette résolution doit atteindre est tout autre.

Ce qu'il nous faut, c'est une longitude pour les fins ordinaires, là-dessus repose le calcul de l'heure universelle, qui, il est inutile de le dire, doit s'adapter à l'usage du monde entier.

M. de Professeur ADAMS, délégué de la Grande Bretagne. M. le Président, je ne sais si je dois entretenir la Conférence à ce sujet; je crois cependant que c'est une question de peu d'importance que nous considérions la longitude comme positive, en calculant vers l'est, ou comme négative, en calculant vers l'ouest, ou en allant de zéro à 360 degrés le résultat, dans le sens mathématique, est le même. Nous ne pouvons jamais considérer des lignes ou des angles mathématiques comme positifs dans une direction sans supposer qu'ils sont négatifs dans la direction contraire. L'un n'est que le complément de l'autre.

En ce qui me concerne, je dirai qu'il est inutile que la Conférence décide que nous devons compter les longitudes en allant vers l'est exclusivement.

La Conférence pourrait dire que si la longitude est comptée en allant vers l'est, elle est positive; et si elle est comptée en allant vers l'ouest, elle est négative; c'est tout ce que nous aurions à dire. Je ne crois pas que la Conférence ait qualité pour dire que les mathématiciens ne pourront calculer les longitudes que dans une seule direction. Que vous parcourriez tous les 360 degrés ou non, c'est une question de détail, et qui, ici, a fort peu d'importance au point de vue scientifique. Vous pouvez adopter l'un ou l'autre moyen.

M. SANDFORD FLEMING, délégué de la Grande-Bretagne. Je prendrai la liberté de suggérer que cette question de détail peut fort bien être discutée et réglée par un comité, sans quoi elle pourrait bien absorber tout le temps dont la Conférence dispose. Je propose donc

qu'un comité soit nommé à l'effet d'étudier cette question et de présenter son rapport à la prochaine réunion.

Le PRÉSIDENT. Nous n'avons d'autre désir que celui de donner satisfaction au vœu de la Conférence, mais nous ne voyons pas bien ce que l'on gagnerait à nommer un comité. Néanmoins, si la Conférence souhaite qu'un comité soit nommé, la question portera sur l'organisation de ce comité, et nous éprouvons quelque hésitation à le designer.

M. RUTHERFURD, délégué des États-Unis. M. le Président, s'il s'agissait d'une question nouvelle au sujet de laquelle il n'y eut pas eu de discussion, il serait très à propos de la confier à un comité chargé de la préciser, et par ce moyen rendre plus brèves nos délibérations, mais il me semble qu'en ce moment la désignation d'un comité ne serait pas utile. Lorsque le rapport du comité arriverait, nous serions obligés de procéder exactement comme nous le faisons à présent.

Trois questions seulement sont présentées à la Conférence, et elles sont renfermées dans de très étroites limites. Premièrement, devons-nous compter les longitudes en deux sens? Deuxièmement, devons-nous compter tout le pourtour de 360 degrés? Troisièmement, si oui, dans quelle direction devons-nous compter?

Telles sont les seules questions, et en somme, ce sont des questions de convenance. Nous sommes tout aussi bien en mesure de voter maintenant sur ces questions que nous le serions après la désignation d'un comité.

M. le Baron VON SCHÆFFER, délégué d'Autriche-Hongrie. M. le Président, je propose que la Conférence s'ajourne jusqu'à demain à une heure de l'après-midi.

La question relative à la motion d'ajournement ayant été présentée et acceptée, la Conférence s'ajourne à 3 heures 45 de relevée jusqu'à demain, mardi, le 14 courant, à une heure de l'après-midi.

PROTOCOLE V.

SÉANCE DU 14 OCTOBRE 1884.

La Conférence se réunit au jour fixé dans la Salle des Diplomates du Département d'État à une heure de l'après-midi.

Sont présents:

Allemagne: M. le Baron H. von Alvensleben, M. Hinckeldeyn.
Autriche-Hongrie: M. le Baron Ignace von Schæffer.
Brésil: M. le Dr. Luiz Cruls.
Chili: M. F. V. Gormas et M. A. B. Tupper.
Colombie: M. le Commodore S. R. Franklin.
Costa-Rica: M. Juan Francisco Echeverria.
Espagne: M. Juan Valera, M. Emilio Ruiz del Arbol, M. Juan Pastorin.
États-Unis: M. le Contre-Amiral C. R. P. Rodgers, M. Lewis M. Rutherfurd, M. W. F. Allen, M. le Commandant W. T. Sampson, M. le Professeur Cleveland Abbe.
France: M. A. Lefaivre, M. Janssen.
Grande-Bretagne: Sir F. J. O. Evans, M. le Professeur J. C. Adams, M. le Lieutenant-Général Strachey, M. Sandford Fleming.
Guatémala: M. Miles Rock.

Hawaïi: L'Honorable William D. Alexander, l'Honorable Luther Aholo.
Italie: M. le Comte Albert de Foresta.
Japon: M. le Professeur Kikuchi.
Libérie: M. Coppinger.
Mexique: M. Leandro Fernandez, M. Angel Anguiano.
Pays-Bas: M. G. de Weckherlin.
Paraguay: M. le Capitaine John Stewart.
Russie: M. C. de Struve, M. le Major-Général Stebnitzki, M. J. de Kolo-grivoff.
Saint Domingue: M. de J. Galvan.
Salvador: M. Antonio Batres.
Suède: M. le Comte Carl Lewenhaupt.
Suisse: M. le Colonel Émile Frey.
Turquie: Rustem-Effendi.
Vénézuéla: M. le Dr. A. M. Soteldo.

Est absent:
Danemark: M. C. S. A. de Bille.

A l'ouverture de la séance, le PRÉSIDENT annonce que dans l'ordre du jour régulier la première question à discuter aujourd'hui par la Conférence est la proposition du délégué de la Grande-Bretagne, M. Sandford Fleming, qu'un comité soit chargé d'examiner un rapport sur la résolution présentée hier. M. Fleming m'a fait comprendre ce matin qu'il ne désirait pas insister sur cette proposition, et que par conséquent on peut la considérer comme étant rétirée.

La Conférence aura donc à s'occuper de l'amendement présenté par le délégué d'Espagne, M. Juan Pastorin, et si cet amendement est accepté ou bien retiré, on aura à revenir sur la question de l'amendement présenté par le délégué de la Suède, M. le Comte Lewenhaupt.

Ces deux Messieurs ayant manifesté le désir de retirer leurs propositions, nous n'avons pour le moment à nous occuper que de la résolution présentée par le délégué des États Unis, M. Rutherfurd.

RUSTEM-EFFENDI, délégué de Turquie. En votant hier en faveur des résolutions proposées par l'honorable délégué des États-Unis, je tiens à faire constater que mon vote ne lie pas mon Gouvernement. Je suis même obligé de voter contre toute proposition qui tendrait à lui imposer une obligation, car je désire lui conserver sa liberté d'action dans la matière. Je m'engage à soumettre à mon Gouvernement le résultat de nos délibérations et de lui en recommander l'adoption. En d'autres termes, je n'ai voté que *ad referendum*, et je demande que ma déclaration soit consignée dans le protocole.

M. le PRÉSIDENT. Nous ferons remarquer au délégué qui vient de parler que la même déclaration a été faite par plusieurs délégués dans une séance antérieure de la Conférence.

M. JANSSEN, délégué de France. Je crois que la doctrine très correcte, qui vient d'être exprimée par M. le délégué de Turquie, Rustem-Effendi, est celle qui est admise par tous les membres du Congrès, et que nous avons tous voté *ad referendum*.

M. le PRÉSIDENT. Nous avons toujours compris que tel était le sentiment de la Conférence, depuis qu'il a été exprimé dans une de ses premières séances, où plusieurs délégués firent la même déclaration.

M. ANTONIO BATRES, délégué de Salvador. M. le Président, j'ai dû m'absenter hier pour cause d'indisposition, et je demande l'autorisation de faire enregistrer mon vote en faveur de la résolution adoptant comme premier méridien celui de Greenwich.

Aucune objection n'étant faite, le Président donna ordre au Secrétaire d'enregistrer le vote du délégué de Salvador dans le procès-verbal.

M. le PRÉSIDENT. Le délégué d'Espagne, M. Pastorin, a retiré son amendement, et le délégué de Suède, M. le Comte Lewenhaupt, a aussi retiré l'amendement, qu'il avait présenté, à la proposition du délégué des États-Unis, M. Rutherfurd. La proposition qui a été premièrement présentée va maintenant être lue.

Le Secrétaire lit alors la proposition qui suit:

A partir de ce méridien (c'est-à-dire, du méridien de Greenwich) la longitude sera comptée dans deux directions jusqu'à 180 degrés, la longitude est étant (+) plus, et l'ouest (—) moins.

M. SANDFORD FLEMING, délégué de la Grande-Bretagne, représentant le Canada. Je désire soumettre quelques observations relativement à la résolution dont la Conférence est saisie, mais il m'est impossible de séparer la question particulière de la question générale. Pour moi, la longitude et l'heure sont si intimement liées qu'elles deviennent inséparables de fait, et lorsque je m'arrête à penser à la longitude, mon esprit retombe naturellement sur l'heure qui en est la mesure. J'espère donc qu'il me sera permis d'étendre mes observations un peu au-delà des limites de la résolution. J'abonde dans le sens de ceux qui croient que la longitude ne doit être calculée que dans une seule direction, et je suis disposé à appuyer un système de notation différent sous d'autres rapports de celui que l'on emploie ordinairement.

Si l'on adopte un système d'heure universelle, il y aura un avantage à posséder un système d'heure et un système de longitude terrestre entre lesquels il existera une parfaite harmonie. Le cours de l'heure est continu, en conséquence je pense que la continuité devrait s'appliquer au calcul de la longitude. Pour bien faire comprendre ma pensée, des explications quelque peu étendues deviennent nécessaires.

Il y a une dizaine de jours je me suis permis de présenter à Messieurs les délégués, à titre non officiel, et ma manière de voir et une série de recommandations sur se sujet. Qu'il me soit permis de les soumettre aujourd'hui à la Conférence.

Le PRÉSIDENT. Nous désirons demander à la Conférence si les recommandations et les observations imprimées qui ont été adressées à Messieurs les délégués, il y a quelques jours, par M. Sandford Fleming, délégué de la Grande-Bretagne, peuvent être insérées au protocole comme si elles étaient présentées aujourd'hui. Un exemplaire de ces documents a été fourni à chacun des membres, nous a-t-il été dit.

M. TUPPER, délégué du Chili. M. le Président, les délégués du Chili ne les ont pas reçus.

Le PRÉSIDENT. Nous aurons soin de les leur faire parvenir.

La requête du délégué de la Grande-Bretagne, M. Sandford Fleming, n'ayant soulevé aucune objection, ce délégué continue ainsi qu'il suit:

L'adoption d'un méridien initial, commun à toutes les nations, comporte l'établissement d'un système pour le calcul de l'heure pouvant également satisfaire notre raison et nos besoins.

Ce système nous manque actuellement. La méthode usitée observée depuis un temps immémorial pour les notations, quelles que soient ses avantages lorsqu'il s'agit d'espaces limités, a donné lieu à des confusions et créé de nombreuses difficultés quand il s'est agi d'un vaste continent, couvert d'un réseau de chemins de fer et de télégraphes. En outre, il est insuffisant quand il s'agit de problèmes scientifiques qui constituent l'un des traits les plus marquants des recherches modernes.

Si l'on prend le globe dans son ensemble, il n'est pas possible aujourd'hui de déterminer le commencement d'une année, d'un mois, d'une

semaine. L'intervalle de temps, compris dans une journée, telle qu'elle est ordinairement définie, n'existe pas. D'après la définition que nous avons admise, une journée est d'ordre local; elle est limitée à un seul méridien. Sur un point quelconque du globe, une journée commence tandis qu'à un autre elle finit. Ainsi, tandis que la terre opère une révolution diurne, nous avons sans cesse sur notre planète un grand nombre de jours à des degrés différents de progrès.

Les heures et les minutes participent naturellement de cette irrégularité nécessaire. Les horloges les plus parfaites comme mécanisme ne sont plus d'accord si elles diffèrent quant à la longitude. Dans l'état actuel des choses, elles doivent, du moins en théorie, indiquer une heure différente non-seulement dans le même état, dans la même province, mais encore, jusqu'à un certain point, dans la même ville.

Comme nous avons pour but le progrès général de la science, nous ne pouvons manquer d'être surpris de l'existence de ces ambiguités et de ces anomalies, d'autant plus que depuis longtemps elles sont connues. A l'époque primitive de la race humaine, alors que la vie n'était pas encombrée par les complications qui sont nées de la civilisation, lors que les tribus s'adonnaient aux occupations pastorales, et que les communautés vivaient isolées les unes des autres; quand le commerce était restreint à quelques villes et que les communications entre pays éloignés étaient rares et difficiles; à cette époque le besoin d'un système général et uniforme pour l'heure ne se faisait pas sentir. Aucun inconvénient ne résultait pour les diverses localités de ce que chacune employât son propre système horaire. Mais les conditions dans lesquelles nous vivons ne sont plus les mêmes. L'application de la science aux moyens de locomotion et à la transmission instantanée de la pensée et de la parole a graduellement diminué l'espace et effacé les distances. Le monde entier est devenu voisin, une parenté intime s'est établie, et nous avons reconnu les inconvénients d'un grand nombre d'influences désavantageuses à l'égard des calculs appliqués à l'heure, désavantages absolument inconnus aux générations éteintes à l'esprit desquelles ils ne s'étaient même pas présentés. Il est aussi évident que, au fur et à mesure des progrès de la civilisation, ce mal loin de diminuer ne fera que s'accroître, et que le remède efficace consiste à changer les usages de la tradition à l'égard du calcul des jours et des heures, sans nous préoccuper du coup porté aux anciennes coutumes et aux préjugés qu'elles ont fait naître.

Dans les pays de peu d'étendue il est facile de se rendre maître de la difficulté. Au moyen d'une entente commune, on peut arriver à un arrangement qui ait rapport à la communauté en particulier et arriver à écarter les faux principes qui ont donné le jour à des dissidences et au désaccord. Dans la Grande-Bretagne l'heure de l'observatoire de Greenwich est devenue d'un usage général. Mais cette méthode s'écarte des principes qui président à la fixation de l'heure locale, et par suite, si ces principes ne sont pas erronés, toutes les horloges du Royaume Uni font nécessairement erreur, sauf celles qui se trouvent immédiatement placées sur la ligne allant du nord au sud.

Sur le continent de l'Amérique du Nord, on a récemment fait des efforts pour vaincre cette difficulté. Des mesures couronnées de succès ont été prises pour porter remède aux influences ennemies dont il est question, et en même temps ces mesures se trouvent en harmonie avec des principes dont la solidité ne saurait être contestée.

Quand nous considérons le temps dans le sens abstrait, nous sommes forcément convaincus qu'il n'a aucun point de ressemblance avec les objets qui frappent nos sens; il est immatériel, n'a point de forme, point

de substance, point d'essence spirituelle. Il n'est ni solide, ni liquide, ni gazeux. Néanmoins il est susceptible d'être mesuré avec la plus grande précision. On peut cependant douter que rien de commensurable puisse être soumis à des principes plus faux que ceux sous l'empire desquels on agit de nos jours en ce qui le concerne.

Comment nous y prenons-nous pour calculer le temps? Notre système implique qu'il existe un nombre infini de conceptions dénommées "temps." Nous parlons de l'heure solaire, astronomique, marine, civile, de l'heure apparente et moyenne. Néanmoins nous assignons à chaque point particulier sur la surface du globe une heure distincte et également variée. Les usages dont nous avons hérité impliquent qu'il existe un nombre infini d'heures. Tout cela n'est-il pas contraire à la raison et en opposition avec cette vérité essentielle, qu'il n'y a qu'une seule heure?

On peut comparer le temps à un grand cours d'eau fuyant toujours et toujours. Pour nous, la nature, dans sa plus grande étendue, est une unité. Nous n'avons qu'un globe, qu'un univers, quelle que soit la multitude des parties qui le composent. Il est inconcevable qu'il puisse exister plus d'une transition dans le temps.

A tous les points de vue, il est évident que le jour est venu de réformer notre système de calcul appliqué au temps. Les conditions de la civilisation moderne exigent la création d'un vaste système renfermant ce principe, que le temps est une conception abstraite et que la définition de toutes ses parties doit être basée ou se rapporter à une unité de mesure.

En m'appuyant sur ces bases, je me crois autorisé à demander respectueusement à cette Conférence qu'elle prenne en considération une série de recommandations que je prends la liberté de lui soumettre.

Toute nation civilisée est évidemment intéressée dans cette question. On pourrait même dire que tout être humain y a plus ou moins intérêt. Le problème est d'une importance universelle, et sa solution ne saurait naître que de l'adoption générale d'un système basé sur des principes reconnus comme indiscutables.

Ces principes se trouvent énoncés dans les recommandations qu'il m'est permis de soumettre à la Conférence. Ils comprennent, comme condition essentielle, l'établissement d'une unité de mesure; il est évident que cette unité doit tirer son origine du cours des astres. Il n'est point de mouvement plus uniforme que celui de la terre sur son axe. Cette révolution journalière est susceptible de la mesure la plus minutieuse et constitue sous tous les rapports l'unité de mesure la plus propice; elle fournit une division du temps définie et précise, une division qui, sans difficulté, peut être établie d'une façon simple et évidente.

Une révolution de la terre, déterminée au moyen du passage solaire sur le méridien initial ou sur le méridien anti-initial, sera admise par le monde entier comme une période de temps commune à tous les hommes. Au moyen d'un accord général cette période pourrait être considérée comme l'unité commune au moyen de laquelle le temps serait partout mesuré aux fins de la science, du commerce et de la vie journalière.

Le projet contenu dans les recommandations a pour but trois points principaux, à savoir:

1. Définir et établir un jour universel pour assurer l'exactitude chronologique des dates communes au monde entier.

2. Arriver à un système d'heure universelle sur une base que toutes les nations pourront adopter, au moyen duquel, partout, simultanément, le même instant pourra être observé.

3. Établir un système vrai et rationnel pour le calcul du temps civil pouvant être partout adopté, et assurer ainsi l'uniformité et l'exactitude sur tout le globe.

Mais au moment d'inaugurer un plan qui affectera un si grand nombre, il est à désirer de ne point porter, plus qu'il ne le faut absolument, atteinte aux usages dominants. Les effets de l'habitude sont puissants et il doit en être tenu compte. Il y a lieu d'admettre qu'il sera difficile de changer immédiatement les usages auxquels la majorité des hommes sont accoutumés. Dans la vie journalière nous avons coutume de manger, de dormir et de suivre les habitudes de l'existence à certaines périodes de la journée. Le nombre d'heures qui indique ces périodes nous est familier et nécessairement un grand nombre de personnes trouvera qu'il n'y a guère lieu d'en changer la nomenclature, notamment celles qui s'inquiètent peu des causes et des effets, et qui comprennent difficilement la nécessité de porter remède à une irrégularité, généralement condamnée peut-être, mais dont les effets les touchent peu individuellement.

Nous devons donc pour le moment adopter de notre mieux le nouveau système aux habitudes des hommes telles que nous les trouvons enracinées.

Les recommandations contiennent des dispositions relatives à cette circonstance au moyen desquelles en même temps que le calcul de l'heure locale serait basé sur les principes énoncés, les heures et leur nombre ne varieraient pas d'une façon appréciable en égard à celles qui sont familières. De cette façon, le calcul de l'heure pourrait, en ce qui concerne les affaires usuelles dans chaque localité, s'accorder avec le système général.

Un type de l'heure pour le Canada et les États-Unis a été établi conformément à ce principe. Son adoption a fourni la preuve des avantages que l'on peut généralement obtenir par les mêmes moyens. De toute part on a grandement apprécié ces avantages, aucun changement atteignant si intimement la vie commune n'a jamais été accepté avec autant d'unanimité. Ceci constitue certainement un pas important vers l'établissement d'une heure universelle ou, conformément à la désignation employée dans les recommandations, d'une heure cosmique.

La promptitude et l'unanimité avec lesquelles le changement a été accepté dans l'Amérique du Nord encourage à penser que l'introduction de l'heure cosmique dans la vie journalière n'est pas impossible.

L'intelligence publique ne tardera pas à reconnaître que l'adoption de principes, vrais en ce qui concerne le calcul de l'heure, ne change en rien et n'affecte pas sérieusement les usages auxquels nous sommes habitués.

Il n'en résultera certainement aucune perte sérieuse. Le soleil se lèvera et se couchera pour régler les affaires de la société. Toutes les classes appendront bientôt à comprendre quand il sera midi quelque soit le chiffre indiqué sur le cadran, soit six, comme au temps de l'Écriture, soit douze, soit dix-huit ou tout autre nombre. On se lèvera, on se couchera, on commencera et on finira le travail, on déjeunera et on dînera aux mémes périodes du jour qu'à présent, et nos usages, nos coutumes sociales, ne seront point changés; ils dépendront, ainsi qu'il en est aujourd'hui, du phénomène journalier de la présence de la lumière et de l'envahissement de l'obscurité.

Le seul changement portera sur l'annotation des heures, de façon à obtenir l'uniformité à toutes les longitudes. On doit s'attendre à ce que ce changement occasionne d'abord une certaine surprise, et que les masses le comprendront avec assez de difficulté. Les causes de ce

changement paraîtront insuffisantes ou fantaisistes au plus grand nombre. Mais dans quelques années ce sentiment aura disparu, et les avantages à obtenir deviendront si évidents que je ne doute pas qu'une réforme si désirable ne s'attire la faveur générale et n'en vienne à être adoptée dans toutes les affaires de la vie.

Quoiqu'il en soit, il me semble très important qu'un système compréhensif d'heures soit inauguré pour faciliter les observations scientifiques et établir d'une manière précise l'ordre chronologique des dates; il doit être adopté à l'usage général des chemins de fer, des télégraphes, et à telles autres fins que l'on pourra juger opportunes.

Le jour cosmique présenté dans les recommandations serait la date du monde reconnue par toutes les nations. Il serait théoriquement et pratiquement la moyenne de tous les jours locaux et le type commun auquel se rapporteraient tous les calculs locaux.

En ce qui concerne le calcul de la longitude, je crois que la longitude et l'heure sont en si intimes relations qu'elles peuvent être exprimées par une seule notation. La longitude est simplement l'angle formé par deux plans passant par l'axe de la terre, tandis que le temps est la période que la terre met à faire sa révolution dans cet angle. Si nous adoptons le système de mesurer le temps au moyen de la révolution de la terre à partir d'un zéro reconnu, l'un de ces plans, celui passant par zéro, devient fixe; l'autre, celui qui passe par le méridien local, étant mobile, l'angle de longitude est variable. Évidemment l'angle variable doit être mesuré à partir du plan fixe désigné zéro, et comme le mouvement de la terre, au moyen duquel se mesure le temps équivalent est continu, la longitude doit être calculée continuement dans une même direction. La direction est déterminée par la notation des méridiens horaires, c'est à dire, de l'est à l'ouest.

Si la longitude est ainsi calculée et marquée conformément aux termes employés dans l'annotation du temps cosmique, l'heure, sur toutes les parties du globe, désignera invariablement la longitude exacte de la localité directement située sous le soleil moyen. Réciproquement, à l'époque du passage du soleil moyen sur n'importe quel lieu, la longitude étant connue, le temps cosmique sera le même et en parfait accord avec la longitude de la localité.

Les avantages d'un semblable système de calcul et de nomenclature, tel qu'il est présenté dans les recommandations que j'ai l'honneur de soumettre à la Conférence, sont, je pense, de nature évidente.

Du règlement de l'heure et du calcul de la longitude:

Recommandations:

1. Qu'un système universel de l'heure soit établi, dans le but de faciliter les observations sinchroniques scientifiques, pour les calculs chronologiques, pour les fins du commerce par mer et par terre, et pour tous les usages auquel il est applicable.

2. Que ce système soit établi à l'effet de devenir d'un usage général chez tous les peuples et qu'il soit propre à être adopté par chaque administration distincte dans tous les cas où l'utilité en sera reconnue.

3. Que le système ait pour base ce principe que, pour tous les calculs relatifs à l'heure sur la terre, il ne doit exister qu'une seule unité de mesure et que tous les intervalles de temps mesurés soient en relation directe avec l'unité de mesure.

4. Que l'unité de mesure soit la période employée par la révolution diurne de la terre, définie par passage du soleil moyen sur le méridien de douze heures, à partir du méridien initial qui passe par Greenwich.

5. Que l'unité de mesure définie comme ci-dessus soit considérée comme un jour absolu et appelée jour cosmique.

6. Que ces jours cosmiques soient réputés dates chronologiques de la terre, changeant à l'instant du passage du soleil moyen, sur l'anti-méridien de Greenwich.

7. Que toutes les divisions et les multiples du jour cosmique soient connues sous le nom d'heure cosmique.

8. Que le jour cosmique soit divisé en heures, comptées en une seule série, de un à vingt-quatre (1 à 24), et que les heures soient subdivisées, comme les heures ordinaires, en minutes et en secondes.

Nota.—Comme moyen de distinguer les heures cosmiques des heures dans les calculs locaux, elles pourront être désignées par les lettres de l'alphabet, qui, en omettant l'I et le V, sont au nombre de vingt-quatre.

9. Que jusqu'à ce que l'heure cosmique soit acceptée comme le moyen reconnu de compter dans les affaires ordinaires de la vie, il est opportun d'assimiler le système aux usages actuels et de fournir le moyen de traduire facilement les calculs locaux en heures cosmiques et *vice-versâ;* que, en conséquence, dans la théorie et aussi approximativement qu'il sera possible dans la pratique, les calculs locaux soient basés sur un intervalle connu en avance ou en retard de l'heure cosmique.

10. Que la surface du globe sera divisée par vingt-quatre méridiens horaires équidistants, correspondant aux heures du jour cosmique.

11. Que, autant qu'il sera possible, les divers méridiens horaires soient déterminés d'accord avec la longitude de la localité, pour régler les calculs locaux, d'après une méthode similaire à celle qui est en usage sur l'étendue de l'Amérique du Nord.

12. Que, dans tous les cas où un méridien horaire sera adopté comme type pour régler les calculs locaux dans une section ou dans un district donné, le jour civil sera entendu comme commençant douze heures avant et finissant douze heures après le passage du soleil moyen sur ce méridien horaire.

13. Que le jour civil, basé sur le méridien initial de Greenwich, devra coïncider et être tout un avec le jour cosmique. Les jours civils sur les méridiens à l'est de Greenwich seront, conformément à la longitude, un nombre connu d'heures, ou d'heures et de minutes en avance de l'heure cosmique, et à l'ouest de Greenwich il arrivera le contraire.

14. Que la surface du globe étant divisée par vingt-quatre méridiens équidistants, à quinze degrés l'un de l'autre, correspondant aux heures du jour cosmique, il est opportun de calculer la longitude d'après les méridiens horaires.

15. Que les divisions de longitudes moindres d'une heure (quinze degrés) seront comptées par minutes, secondes et fractions de secondes.

16. Que la longitude sera calculée de continuité en allant vers l'ouest, à partir de zéro, et en commençant à l'anti-méridien initial à douze heures de Greenwich.

17. Que la longitude, généralement, sera indiquée dans les mêmes termes que ceux employés pour désigner l'heure cosmique.

Je soumets ces recommendations à titre de suggestions et sans être animé du désir de les imposer. Je me considèrerai comme satisfait si les principes y énoncés méritent l'approbation de la Conférence.

En ce qui concerne la question plus immédiate, j'en suis arrivé à être entièrement convaincu qu'une extrême simplicité de calcul, et les avantages qui s'y rattachent, seraient obtenus si la longitude était annotée de la même façon et désignée dans les mêmes termes que l'heure universelle. Si, en conséquence, la Conférence adopte la proposition de l'éminent délégué des États-Unis, laquelle, ce me semble, a pour but

d'occasionner le moins de changements possibles dans les usages des navigateurs, je me plais à espérer que d'autres intérêts d'une grande importance ne seront pas négligés. Je veux parler de tous les intérêts si directement en cause, pour ce qui a égard à assurer une heure exacte à terre et à posséder des méthodes faciles de traduire n'importe quel calcul local en un autre calcul local, ou de la rapporter au type de l'heure universelle. A ce point de vue, j'espère que la Conférence émettra une expression d'opinion en faveur de l'extention autour du globe du système de méridiens horaires dont les avantages se sont fait connaître dans l'Amérique du Nord. Au point de vue, de l'instruction seulement, il me semble important que les méridiens horaires, numérotés sans interruption de un à vingt-quatre, à partir de l'anti méridien vers l'ouest, soient distinctement marqués sur nos cartes et sur nos plans.

M. le Professeur ADAMS, délégué de la Grande-Bretagne. Je désire, M. le Président, exprimer mon entière adhésion à la proposition qui vient d'être faite par le délégué des États-Unis, M. Rutherfurd. Il me semble qu'elle satisfait une des conditions principales que nous avons eues devant nous pour guider notre décision, c'est-à-dire, que nous devons poursuivre une voie qui nous causera le moins d'inconvénients. Maintenant, je crois, quant à ce point, que si nous ne le perdons pas de vue, nous trouverons très peu de difficulté à nous décider de compter la longitude *est* comme positive ou plus, et la longitude *ouest* comme négative ou moins. Cette manière de compter apporterait le moindre inconvénient; de fait elle n'apporterait pas du tout d'inconvénient puisqu'elle continuerait à se baser sur celle employée aujourd'hui. Quant à moi, je ne vois aucune raison valable pour changer cela. Il n'y a pas de raison scientifique, et il n'y en a pas certainement de pratique. Il n'y a pas de raison scientifique parce que, comme je le disais hier, si en mathématiques vous mesurez à partir de zéro une distance dans une direction et la considérez comme positive, vous devez, par la nature même de ce cas, considérer la distance, mesurée dans la direction opposée à partir du même zéro, comme négative. L'une découle mathématiquement et nécessairement de l'autre, et ainsi vous renfermez les deux cas dans une formule générale en adoptant cette résolution.

Il me semble tout aussi scientifique, pour le moins, de partir de zéro et d'aller dans les deux directions, distinguant ces deux directions par les signes (+) plus et (—) moins—comme si ces directions étaient distinguées par les termes est et ouest. Cela revient à peu près au même, et cela me paraît tout aussi scientifique que de compter de zéro à 360 degrés. En effet, que faites-vous si vous allez sans interruption de zéro à 360 degrés? Vous vous arrêtez à 360 degrés. Vous ne continuez pas à compter dans le même sens après avoir fait une révolution, mais vous pouvez continuer et faire une seconde révolution jusqu'à ce que vous reveniez à zéro et là vous vous arrêtez. Mais ceci offre de très grands inconvénients, car vous fixez le point d'interruption dans des pays d'une population dense. Vous calculeriez un angle d'un peu moins de 360 degrés d'un côté du premier méridien, et de l'autre côté vous obtiendriez un bien petit angle; ce qui me semble être d'un très grand inconvénient. Dans l'autre cas, c'est-à-dire en désignant la longitude par *est* et *ouest*—vous faites 180 degrés *est* et vous vous arrêtez; vous recommencez à zéro et vous faites 180 degrés *ouest*, et de cette façon vous évitez l'emploi de grands nombres. Il est vrai que vous arrivez au même point de l'autre côté, mais il y a une interruption au point de 180 degrés plus (+) et au point de 180 degrés moins (—). Or, on conviendra que c'est en pleine mer que doit se trouver le point d'interruption le plus favorable, il s'y trouve peu de terre et peu d'habitants, et c'est là où nous avons

l'habitude aujourd'hui de fixer ce point d'interruption. Ceci n'occasionnerait aucun changement dans les habitudes ou dans les coutumes du monde, et nul inconvénient ne serait causé par la décision de la Conférence, basée sur cette méthode. Mais en adoptant le calcul de la longitude de zéro à 360 degrés cela donnerait lieu à un changement des plus considérables, et je pense qu'il est très douteux qu'il puisse être généralement accepté. Vu ces circonstances, je trouve que la résolution comporte la voie la plus profitable. Je n'ai aucune objection à qui veut le faire de calculer pour certains besoins de zéro à 360 degrés; mais je ne crois pas qu'il serait bien de le rendre obligatoire.

En ce qui concerne la proposition du délégué de la Grande-Bretagne, M. Fleming, je ferais observer qu'elle serait accompagnée de bien des inconvénients, parce qu'elle déroge aux usages et aux coutumes qui existent, et ceci, à mon sens, est une bien grande et insurmontable objection, et je ne vois aucun avantage qui pourrait la compenser.

En ce qui regarde la question du temps, que M. Fleming est anxieux de prendre en considération, je trouve que rien ne peut être plus simple, s'il m'est permis de traiter cette question, que le rapport entre les heures et la longitude qui a été établi par la résolution de M. Rutherfurd.

Quelle est cette resolution? Vous ne pouvez pas avoir une même heure pour chaque endroit de la terre, c'est vrai; mais la longitude doit entrer dans la considération du rapport qui existe entre l'heure locale et l'heure universelle. Mais, qu'y a-t-il de plus facile que la méthode que comporte la résolution de M. Rutherfurd? Voici: l'heure locale de n'importe quel lieu est égale à l'heure universelle *plus* la longitude du lieu, *plus* étant toujours compris dans l'acception mathématique, ou bien *moins* la longitude du lieu. La longitude doit être ajoutée à l'heure locale si elle est positive, et retranchée si elle est négative. Ceci est des plus simples, le tout étant compris dans la formule générale.

Or, je trouve qu'il serait tout à fait impossible à M. Fleming de rédiger une formule plus simple que celle-là. La formule établie dans les procès-verbaux de la Conférence de Rome est beaucoup moins simple, *car elle exigeait un terme additionnel de* 12 *heures.* Vous faisiez l'heure universelle égale à l'heure locale *moins* la longitude *plus* les 12 heures. Cela est loin d'être simple et rend les calculs beaucoup plus compliqués, et il me semble que pour d'autres raisons cette formule peut donner matière à des objections.

M. RUTHERFURD, délégué des États-Unis. M. le Président, je ne veux pas faire perdre trop de temps à la Conférence en réitérant les remarques très concluentes en faveur de cette résolution, faites par M. le délégué de la Grande-Bretagne. Je voudrais donc vous faire envisager, pendant quelques instants, cette question à un autre point de vue. Supposons, par exemple, que nous n'adoptions pas cette résolution, quelle serait alors la ligne de conduite à suivre par la Conférence? Dans ce cas, nous devrions sans doute décider que la longitude devrait se compter de zéro à 360 degrés.

Cette proposition générale est une de celles qui ne rencontreraient probablement pas une bien violente opposition, mais le point qui suit nous divisera d'une manière très essentielle et peut-être désastreuse. De quel côté allons-nous compter? Sera-ce vers l'est ou vers l'ouest? Mes différents entretiens avec MM. les délégués me permettent de supposer qu'il existe une bien grande différence d'opinion sur ce point, et je crois que si nous n'adoptions pas cette résolution, et que si nous adoptions de compter la longitude de zéro à 360 degrés, et si en outre nous voulions arriver à décider dans quel sens il faudrait compter, ce vote

obtenu à une très faible majorité pourrait compromettre notre influence morale auprès de nos Gouvernements respectifs.

De plus, je doute que nos résolutions soient acceptées par ces Gouvernements, si nous nous présentons à eux ainsi divisés sur une question d'une application aussi pratique que celle-là.

Ce n'est simplement qu'une question de pratique et de convenance. Nous nous soumettons tous à la question de convenance en choisissant le méridien de Greenwich. Et pourquoi? Parce que les sept dixièmes des nations civilisées se servent du méridien de Greenwich, non pas parce que le méridien de Greenwich est intrinsèquement meilleur que celui de Paris, ou de Washington, ou de Berlin, ou de St.-Pétersbourg. Personne n'a rien réclamé en fait de préférence parmi ces capitales. Ce n'était simplement que parce que sept-dixièmes du monde civilisé se servait déjà du méridien de Greenwich.

Or, si nous acceptons ceci comme un bon argument en faveur de la première résolution choisissant le premier méridien, pourquoi ne nous soumettrions-nous pas plus facilement au fait que tout le monde civilisé compte les longitudes des deux manières? Toutes les opinions s'accordent à ce sujet; l'usage aussi. Maintenant devons-nous cesser cet usage? Introduirons nous un nouveau système qui sera ou ne sera pas pratique ou agréable?

N'adopterons-nous pas plutôt la règle déjà en usage par les astronomes et les navigateurs exercés de toutes les nations, en leur disant, allez et continuez à faire comme par le passé.

Sir FREDERICK EVANS, délégué de la Grande-Bretagne. M'étant trouvé en rapport pendant un grand nombre d'années avec les marins pratiques de plusieurs nationalités, je dois avouer le découragement qui s'empare de mon esprit lorsque je considère l'adoption d'un système pour l'annotation des longitudes autre que celui dont il est parlé dans cette résolution.

Mon collègue, M. Fleming, a fait observer qu'il lui était impossible de séparer la longitude de l'heure. S'il avait vécu avec des navigateurs, il se serait aperçu que, dans leur esprit, il existe souvent une différence très marquée entre les deux termes. Pour les marins, longitude signifie espace, distance, et cela indépendamment de l'heure. Longitude indique un certain nombre de milles, parcourus vers l'est ou vers l'ouest. En conséquence, je ne puis considérer la longitude et l'heure comme choses identiques.

D'après ce que je comprends, cette résolution doit aussi être considérée à un point de vue pratique. La question de l'heure universelle sera considérée ensuite, et la façon dont on arrivera à la résoudre me semble avoir fort peu d'importance comparativement à ce qui concerne la présente résolution. Pour ma part, je me demande si aucun autre mode que celui proposé par cette résolution serait généralement accepté. Voilà ce que je crains. Si grand que puisse être le respect des nations pour cette Conférence, l'opinion publique serait très prononcée en faveur du sujet que nous discutons maintenant. Quand on considère en outre que tout autour du globe, que dans toutes ces mers diverses, il existe des colonies ayant leur histoire, que leur position géographique et leurs limites ont été marquées par longitude, conformément aux indications dont j'ai parlé, il me semble trop téméraire de s'attendre à ce que ces colonies acceptent une nouvelle annotation de longitudes, sans qu'on leur donne une plus ample preuve de la nécessité urgente d'un tel changement. Ni les décrets de cette Conférence, ni ceux d'aucun gouvernement ne sauraient amener un tel résultat. Je fais ces remarques

avec tout le respect qui est dû à ceux qui se sont prononcés en faveur d'un changement.

M. le Général STRACHEY, délégué de la Grande-Bretagne. M. le Président, au risque de répéter tant soit peu les observations que j'ai eu l'honneur d'adresser à la Conférence, lors de la dernière réunion, je désirerais ajouter quelques mots à ce qui a été dit. Nous souhaitons que les points qui nous divisent essentiellement soient expliqués autant que possible avant que la Conférence n'en arrive à un vote.

En ce qui touche au système de compter la longitude dans deux directions et les avantages ou les inconvénients qui peuvent résulter de partir de zéro, et d'indiquer la longitude est comme positive ou plus, et la longitude ouest comme négative ou moins, qu'il me soit permis d'appeler l'attention du Congrès sur ce fait, que l'on compte déjà la longitude dans ces deux directions, et que, en fait, la latitude se compte de la même façon dans deux directions à partir de l'équateur, la latitude nord est plus, la latitude sud est moins. Et cependant, personne, autant qu'il m'a été donné de l'entendre, n'a proposé que nous abolissions le système employé pour calculer la latitude et de le remplacer par la distance polaire du nord ou du sud calculée sans interruption autour du globe; néanmoins il existe à ce sujet la même objection quasi-scientifique dans les deux cas. Ainsi que je l'ai avancé, il me semble qu'au point de vue de la convenance pratique il est extrêmement difficile, si non impossible, d'établir une séparation entre les idées sur lesquelles doivent se baser les calculs de longitudes et celles qui devraient présider au calcul de l'heure, surtout en ce qui concerne le calcul de l'heure, quand il s'agit d'adopter un jour universel pour le monde entier. Pour ce qui a égard à l'adoption d'un jour universel, il ne sera évidemment rien moins que commode s'il commence et finit à tout autre moment que celui du passage du soleil sur le 180° méridien. Je crois même qu'il sera très incommode. Je suis d'avis que si le monde en arrivait à adopter le méridien de Greenwich comme méridien initial de longitude, ce qu'il y aurait de plus naturel serait de faire commencer le jour international, le jour universel, sur le 180° méridien de Greenwich, c'est-à-dire, de le faire coïncider avec le jour civil de Greenwich. Ce méridien, comme on l'a déjà dit, passe en dehors de la Nouvelle Zélande et en dehors des îles Fiji, il ne passe que sur une portion minime du pays habité. Il me semble, par conséquent, que puisqu'il est nécessaire qu'il y ait discontinuité ou interruption absolue, c'est-à-dire, interruption d'heure, une interruption de vingt-quatre heures, il est bien préférable que l'interruption ait lieu sur la partie inhabitée du globe qu'au centre de la civilisation, le centre du globe.

Si nous adoptons le jour universel qui correspond au jour civil de Greenwich, vous obtiendrez alors une parfaite continuité du temps local dans le monde entier en rapport avec le jour universel, sauf l'interruption qui a lieu nécessairement sur le 180° méridien. Autrement ceci n'est pas possible. Par exemple, conformément au système proposé par cette résolution, l'heure locale qui correspond, disons-le, à 0 heures de lundi à Greenwich, changerait peu à peu, en faisant le tour du monde, à l'est depuis le 180^{me} méridien occidental, de midi de dimanche à midi de lundi; et en repassant ce méridien, l'interruption aurait lieu encore et un jour semblerait être perdu. Mais une continuité complète des jours et des heures, et un rapport complet avec le jour universel, c'est-à-dire, le jour civil de Greenwich, serait maintenus pour toute la terre, excepté au 180^{me} méridien.

Le résultat du système proposé à Rome serait d'occasionner l'interruption des dates à Greenwich, à midi, de manière que les heures nationales

du jour civil fussent d'une date différente de celles de l'après-midi, et la même chose arriverait dans toute l'Europe. Mais si l'on fait correspondre le jour universel au jour civil de Greenwich, en comptant la longitude est dans un sens et la longitude ouest dans un autre, ces difficultés seraient vaincues, et une formule très simple suffirait pour convertir le temps local en temps universel.

A l'égard de ce qui a été dit relativement à ce que la longitude soit considérée comme positive ou négative, si l'on effectue le mouvement soit vers l'est, soit vers l'ouest, je crois qu'il existe une raison claire, rationnelle pour appeler *plus* la longitude allant à l'est et *moins* la longitude allant à l'ouest. Le temps est plus tardif à l'est, et par conséquent l'heure est plus tardive. En faisant la conversion de l'heure universelle à l'heure locale, si l'opération se fait à l'est de Greenwich, vous ajoutez la longitude à l'heure universelle, et, par ce moyen, vous augmentez le chiffre de l'heure; si l'endroit est à l'ouest de Greenwich vous retranchez la longitude, et vous diminuez ainsi le chiffre de l'heure. Il est donc naturel d'appeler la longitude est positive et la longitude ouest négative. Je crois aussi que le passage du soleil sur le méridien est en réalité ce que l'on peut appeler l'indicateur du jour, le jour étant composé de 24 heures, également réparties des deux côtés du méridien. Il est donc parfaitement logique d'adopter le système de calcul des longitudes proposé par la résolution que nous considérons maintenant, c'est un moyen rationnel et systématique.

M. Juan Pastorin, délégué d'Espagne. J'ai écouté avec un grand plaisir le discours que vient de prononcer notre honorable collègue, le délégué d'Angleterre.

Je ne suis pas assez familier avec la langue anglaise pour faire un discours, quoique je la connaisse suffisamment pour suivre la discussion. De plus, comme j'avais au préalable étudié le sujet qui nous occupe, j'ai bien compris tout ce qui a été dit sur ce point.

J'ai proposé un amendement hier, afin d'arriver à la formule que je considère la plus simple pour passer du temps local au temps cosmique en employant la longitude. Cette formule n'est peut-être pas la plus agréable pour les astronomes et les marins, mais ils forment la minorité, et c'est, j'en suis sûr, la plus facile pour la masse du public. Cette formule doit être le résultat de plusieurs considérations que nous discutons maintenant. Je ne suis pas assez familier avec la langue pour donner les raisons sur lesquelles j'appuyais mon amendement, mais, comme je l'ai démontré dans la brochure que j'ai eu l'honneur d'adresser à mes savants collègues, le moyen, à mon avis, d'arriver à la formule la plus simple et la plus convenable, c'est de faire coïncider le commencement de l'heure et de la date civile du premier méridien, avec l'heure et la date cosmiques, et que la longitude soit comptée sans interruption dans un même sens à partir du méridien initial.

Voilà ce que je proposais d'adopter par mon amendement.

M. le Comte Lewenhaupt, délégué de Suède. M. le Président, je propose que la séance soit levée pendant quelques instants avant de procéder à la votation sur cette résolution.

Personne ne s'opposant, le Président annonce que la séance est levée pour quelques instants.

Le Président rouvre la séance et dit: La suspension a donné occasion à un échange d'opinions sur la matière que nous traitons en ce moment, et si la Conférence est prête nous allons procéder au vote.

M. le Commandant Sampson, délégué des États-Unis. M. le Président, il me semble que la discussion officieuse qui a eu lieu relativement à la question du système applicable au calcul des longitudes est faite pour nous conduire à cette conclusion, qu'il existe une grande divergence

d'opinions. Autant qu'il m'a été donné de m'en convaincre, un grand nombre de délégués sont venus ici avec instructions d'appuyer la résotion adoptée faite par la Conférence de Rome. Il me semble que la proposition de compter la longitude en continuité à partir du méridien initial en allant de l'ouest à l'est, ainsi que le recommande la Conférence de Rome, n'est pas aussi parfaite que la proposition dont nous sommes actuellement saisis. Personnellement, cependant, je préférais voir la longitude comptée en continuité de l'est à l'ouest, vu que cela serait plus conforme au mode actuellement employé par les astronomes; mais comme il semble qu'un si grand nombre de délégués ont reçu instructions de leur Gouvernement d'appuyer la proposition de compter en sens contraire, et comme il leur faudra, si cette Conférence adopte tout autre mode de compter que celui proposé par la Conférence de Rome, soumettre à leurs Gouvernements, comme résultat des décisions de cette Conférence, une chose contraire aux recommandations de la Conférence de Rome, et que ces deux recommandations tendraient naturellement à se neutraliser mutuellement, je suis d'avis d'appuyer la proposition qui nous est présentée en ce moment, comme étant la plus avantageuse.

Je prendrai cependant la liberté de suggérer qu'au lieu de nous prononcer positivement sur cette question, nous la laissions telle qu'elle est, c'est-à-dire, que la longitude sera comptée de l'est à l'ouest à partir du méridien initial sans spécifier dans quelle direction elle sera considérée comme positive, que cette Conférence est d'avis qu'il n'est pas opportun de changer le présent système de calculer les longitudes dans les deux sens à partir du méridien initial.

M. le Comte LEWENHAUPT, délégué de Suède. Dans mon opinion les délégués ne se sont point engagés à recommander toutes les résolutions pour lesquelles il y aura une majorité au sein de la Conférence, mais seulement les résolutions pour lesquelles les délégués votent eux-mêmes. Pour ce qui concerne le fait qu'il y aura une grande divergence d'opinion à l'égard des questions qui restent à décider, je ne peux pas considérer cette circonstance comme une raison de ne pas prendre un vote sur ces questions. Au contraire, il sera d'un grand intérêt pour nos Gouvernements de connaître l'exacte position prise par chaque délégué, et même si un délégué s'abstient de voter, telle abstention est un fait intéressant à connaître en cas de négotiations futures sur ces mêmes questions. Je suis donc d'opinion que nous devrions prendre un vote sur les résolutions qui restent à décider.

On procède au vote sur la proposition du délégué des États-Unis, M. RUTHERFURD, et dont le texte est comme suit:

A partir de ce méridien [*id est* Greenwich] la longitude sera comptée dans deux directions jusqu'à 180 degrés, la longitude est sera dénommée plus et la longitude ouest moins.

Ont voté pour l'affirmative: Chili, Colombie, Costa-Rica, États-Unis, Grande-Bretagne, Guatémala, Hawaïi, Japon, Libérie, Mexique, Paraguay, Russie, Salvador, Vénézuéla.

Ont voté pour la négative: Espagne, Italie, Pays-Bas, Suède, Suisse.

Se sont abstenus de voter: Allemagne, Autriche-Hongrie, Brésil, France, Saint-Domingue, Turquie.

Oui, 14; non, 5; abstentions, 6.

Le PRÉSIDENT annonce alors que la proposition est adoptée.

M. RUTHERFURD, délégué des États-Unis. M. le Président, je propose que lecture soit faite de la troisième résolution qui se trouve sur la circulaire imprimée fournie aux délégués. Elle est libellée comme suit:

La Conférence propose l'adoption d'un jour universel à toutes les fins qui pourront paraître opportunes, et ne devant pas faire obstacle à l'emploi de l'heure locale par-

tout où il conviendra. Ce jour universel devra être un jour solaire moyen; il commencera pour le monde entier au moment de minuit du méridien initial coïncidant avec le commencement du jour civil et la date de ce méridien; il sera compté à partir de zéro jusqu'à vingt-quatre heures.

Cette résolution est tant soit peu complexe, et afin de faciliter la discussion je propose que nous nous occupions de la première clause, à savoir:

La Conférence propose l'adoption d'un jour universel à toutes les fins qui pourront paraître opportunes, et ne devant pas faire obstacle à l'emploi de l'heure locale partout où il conviendra.

Une fois que nous en aurons fini avec cette clause nous pourrons continuer et disposer des autres parties de la résolution primitive.

Le PRÉSIDENT. Vous proposez alors de diviser en deux parties la résolution imprimée dans la circulaire, et vous présentez la première partie à l'examen de la Conférence.

M. RUTHERFURD, délégué des États-Unis. Si telle est la forme la plus parlementaire de la présenter, elle est d'accord avec mes intentions. Il sera plus facile de discuter la question sous cette forme, plus facile de la saisir.

M. DE FORESTA, délégué d'Italie. Je propose comme amendement la résolution V de la Conférence de Rome qui est comme suit:

La Conférence reconnait pour certains besoins scientifiques et pour le service interne des grandes administrations des voies de communication, telles que celles des chemins de fer, lignes de bateaux à vapeur, télégraphes et postes, l'utilité d'adopter une heure universelle, à côté des heures locales ou nationales, qui continueront nécessairement à être employées dans la vie civile.

Le PRÉSIDENT. La question porte maintenant sur l'amendement présenté par le délégué d'Italie.

M. le Professeur ABBE, délégué des États-Unis. Je désirerais demander si cet amendement ajoute quelque chose d'important à la résolution. Je ne pense pas qu'il en soit ainsi; il ne fait que spécifier les détails de la résolution qui nous est soumise. Cette résolution "propose l'adoption d'un jour universel à toutes les fins qui pourront paraître opportunes." L'amendement spécifie simplement quelques-unes de ces fins. C'est une question de détail.

M. ALLEN, délégué des États-Unis. M. le Président, je désirerais proposer un amendement à l'amendement. En voici les termes:

Par heure locale ou civile on entend l'heure moyenne du méridien approximativement central d'une section de la surface de la terre dans laquelle un seul temps normal peut être employé sans inconvénient.

M. RUTHERFURD, délégué des États-Unis. M. le Président, je ne crois pas qu'il soit de la compétence de cette Conférence de définir ce que c'est que l'heure locale. Ceci dépasse de beaucoup notre mission.

M. ALLEN, délégué des États-Unis. Monsieur le Président et Messieurs les délégués, tous les efforts, pour obtenir l'uniformité des procédés scientifiques et usuels, sont nécessités par le besoin de plus de facilité dans la pratique. La grande variété des pièces de monnaie, dont la valeur relative ne peut s'exprimer sans l'emploi des fractions, les divers étalons communs de poids et mesures, sont un obstacle pour l'homme d'affaire et le savant qui, l'un et l'autre, se trouvent en outre embarrassés par le fractionnement presque infini des heures résultant des différentes unités de temps qui sont en usage dans les diverses parties du monde.

Toutes les monnaies ont une valeur relative et d'échange qui a pour base leur poids et leur pureté. Les poids et mesures restent les mêmes, quelle que soit l'unité qui les représente. Mais en principe on ne peut

mesurer le temps que par un mouvement régulier, réel ou apparent. L'heure locale variant nécessairement peu à peu pour un observateur qui se déplace à la surface du globe, ne peut être considérée comme invariable que pour un endroit fixe et déterminé et non pour une personne ou des objets en mouvement autour de la terre. En pratique on doit prendre dans chaque localité le temps local moyen d'un point fixe quelconque.

La question importante à résoudre est de savoir sur quelle étendue de territoire à l'est et à l'ouest du dit point fixe le temps moyen de ce point peut servir, sans inconvénient, à tous les besoins ordinaires. Cette question ne peut être absolument déterminée que par une expérience pratique.

Une étude attentive de ce côté de la question a contribué, peut-être plus que toute autre raison, à la proposition du système d'unité de temps qui dirige maintenant, avec succès, les opérations sur les lignes ferrées d'un parcours de cent vingt mille milles, tant aux États-Unis qu'au Canada, et sur lequel se règlent les affaires de cinquante millions d'habitants.

Avant le changement récent il y avait plusieurs localités où les heures exclusivement employées s'écartaient quelquefois de trente minutes, tant à l'est qu'à l'ouest, du temps local moyen, sans qu'il en résultât d'inconvénient appréciable pour ceux qui en faisaient usage. De ce fait, il fallait inévitablement conclure que, dans ces limites, une même unité pouvait être employée. Le résultat a prouvé le bien fondé de cette conclusion.

Aucune réforme d'intérêt public ne peut être accomplie si on n'étale, dans toute sa nudité, le mal auquel on veut remédier. Il faut démontrer clairement qu'il y aura amélioration, ou que le nouvel état de choses a déjà été expérimenté avec succès. Ici, comme en matière de droit, la coutume et les précédents sont tout puissants. Ce serait une tâche bien difficile que de faire adopter un système horaire quelconque qui pût servir à toutes les classes de la société. Les hommes d'affaires ne considèreraient pas comme bonne une réforme qui introduirait une divergence là où l'uniformité existe déjà, et les directeurs des chemins de fer ne consentiraient pas à faire usage d'une heure locale qui ne coïnciderait pas avec celle dont on se sert dans les autres affaires et exploitations ou qui ne serait pas facilement transformable en celle-ci. En adoptant l'heure d'un jour universel pour tous les besoins de transport dans le monde entier, et, en l'employant à côté de l'heure locale, on ramènerait simplement, et, peut-être le compliquerait-on davantage, l'état de choses qui existait dans ce pays et que la réforme de l'année dernière avait pour but de modifier.

Les administrations des chemins de fer désirent que l'heure, dans leur service, soit exactement la même que celle du public ou qu'en cas de variations la différence soit aussi petite que possible et de nature à être calculée facilement.

Le public qui d'un autre côté n'éprouve guère le besoin d'une heure absolument exacte, excepté dans les questions de transport, refuserait d'accepter un système qui changerait essentiellement ses habitudes d'esprit et son langage habituels. On peut prétendre que la chose est absurde, l'admettre même, mais c'est un fait, et il n'est pas possible de le négliger.

L'adoption d'un jour universel ou de tout autre système horaire, basé sur des méridiens peu nombreux, tels que ceux distants de 90° dont on se servirait à côté de l'heure locale, est donc pratiquement impossible.

Faut-il en conclure qu'il n'y a pas le moindre espoir d'obtenir l'uni-

formité horaire pour des besoins partiques, ou que la proposition de division générale de la surface du globe en sections, basée sur des méridiens distants de quinze degrés ou d'une heure doit fournir le remède? On a fait des objections à cette proposition à cause des difficultés éprouvées, ou que l'on prévoit, dans le voisinage des frontières des sections. On invoque que le contact de deux sections avec des unités de temps différent d'une heure causera des difficultés nombreuses et insurmontables. Dans l'administration des chemins de fer où l'heure joue un rôle plus important que partout ailleurs, les expériences de l'année dernière ont prouvé que cette crainte est chimérique. Il est vrai que l'heure locale approximative d'un certain nombre de villes, près des limites entre les sections orientale et centrale des États-Unis, est encore conservée. On pourrait écrire un curieux chapitre sur les incidents qui ont fait garder l'ancien système, mais cela ne change pas le fond de la question. Le fait tend à prouver seulement qu'une variation de plus de trente minutes avec l'heure locale ne serait pas acceptable.

En deçà et audelà des frontières de deux nations voisines les habitants s'accoutument aux unités de poids, mesures et monnaies des deux pays, et s'en servent constamment sans éprouver d'inconvénients bien graves. En rétablissant une frontière par de nouvelles lignes de démarcation, il il faut s'attendre à des difficultés temporaires dans les transactions commerciales, mais l'histoire des peuples nous prouve que ces difficultés s'arrangent d'elle mêmes. Les ordonnances légales finissent ensuite par déterminer les limites précises des différentes sections.

Si des lois différentes, concernant d'autres intérêts, peuvent exister avantageusement, ou du moins sans inconvénients sérieux des deux côtés de la frontière qui sépare deux États, pourquoi les lois, pour la fixation du temps, feraient-elles exception? Les monnaies et les mesures se distinguent par leur noms. On peut distinguer aussi les unités de temps de la même façon.

L'adoption d'une unité de temps pour tous les besoins de la vie quotidienne, basée sur des méridiens distants de quinze degrés, abolirait pratiquement l'usage de l'heure locale exacte, excepté sur ces méridiens. On pourrait citer de nombreux exemples pour prouver combien inexacte et indéterminée était l'heure locale en usage dans beaucoup de villes des États-Unis avant le changement qui s'est produit récemment.

En dehors des aspirations scientifiques, l'avantage que l'on dit être inhérent à l'usage d'une heure locale qui n'est même approximativement exacte, existe-t-il réellement? Le changement qu'on propose blesserait-il quelque coutume d'une valeur incontestable pour la société? Les expériences de la Grande-Bretagne, depuis le 13 janvier 1848, de la Suède, depuis le 1er janvier 1879, des États-Unis et du Canada, depuis le 18 novembre 1883, répondent victorieusement à ces questions.

On se sert exclusivement en Angleterre de l'heure du méridien de Greenwich qui diffère d'environs huit minutes à l'est et de vingt-deux minutes et demie à l'ouest de l'heure locale moyenne. En Suède, l'heure du quinzième degré de longitude est la seule usitée. Elle diffère d'environs trente-six minutes et demie à l'est, et d'environ seize minutes à l'ouest, de l'heure locale moyenne. Aux États-Unis, les unités de temps récemment adoptées sont exclusivement employées dans les villes, telles que Portland, Me (33,000 habitants), et d'Atlanta, Ga. (37,400 habitants), dont les heures sont respectivement en avance de dix-neuf minutes et vingt-deux minutes sur l'heure normale; à Omaha, Nebr. (30,500 habitants), et Houston, Tex. (16,500 habitants), l'heure locale est en retard de vingt quatre minutes; à Ellsworth, Me., on a fait un changement de vingt six minutes. Presque quatre-vingt-cinq pour cent

de toutes les villes des États-Unis qui, comptant plus de dix milles habitants, ont adopté la nouvelle unité de temps, pour tous les besoins, et elle est en usage sur les quatre-vingt-dix-sept et demi pour cent du parcours total des lignes ferrées.

Considérons maintenant si des difficultés insurmontables dans la pratique en raison des particularités géographiques empêcheront l'adoption de ce système dans le monde entier.

Dans le tableau qu'on a préparé, et qui est annexé à ce discours, sont désignés les divers méridiens normaux et noms suggérés pour les heures des sections correspondantes.

C'est grâce à M. E. B. Elliott, de cette ville, que je puis me servir de ce tableau. Sur le continent de l'Amérique septentrionale, aux États-Unis et au Canada, les 75me, 90me, 105me, et 120me méridiens à l'ouest de Greenwich nous donnent actuellement l'heure. Au Mexique, le 105me méridien occidental est approximativement central, excepté pour le Yucatan qui est traversé par le 90me. Pour le Guatémala, Salvador, et Costa-Rica, le 90me méridien est approximativement central. Saint-Domingue est tout près du 75me, et l'île de Cuba le touche.

Dans l'Amérique du Sud, les États-Unis de Colombie, la République de l'Équateur, le Pérou, la partie occidentale de la Bolivie et le Chili, on emploierait l'heure du 75me méridien occidental, tandis que le Vénézuéla, la Guyane, le Brésil occidental, y compris la région du fleuve des Amazones, la Bolivie orientale, le Paraguay, l'Uruguay et la République Argentine feraient usage de l'heure du 60me méridien. Le Brésil oriental prendrait l'heure du 45me méridien occidental.

Passant en Europe, nous trouvons que la Grande-Bretagne a déjà adopté l'heure du méridien initial dont peuvent se servir aussi la Hollande, la Belgique, la France, l'Espagne, et le Portugal. Le 15me méridien oriental qui est situé à peu près à la même distance à l'est de Berlin qu'il l'est à l'ouest de Vienne, et qui n'est pas plus éloigné de Rome que de Stockholm, est la seule unité horaire en Suède. Cette même heure pourrait être avantageusement employée en Danemark, en Allemagne, en Autriche-Hongrie, en Suisse, en Italie et en Servie. L'heure du 30me méridien oriental, qui est à quelque chose près la moyenne entre celles de Constantinople et de St.-Pétersbourg, pourrait faire loi dans la Russie occidentale, la Turquie, la Roumanie, la Bulgarie, la Roumélie orientale, et la Grèce. Lorsque le développement de la Russie orientale l'exigera, ce vaste pays pourra sans aucun doute être divisé entre les heures des 30me et 45me méridiens orientaux, sur des lignes convenables semblables à celles dont on se sert aux États-Unis. Les méridiens qui s'imposeraient en Afrique semblent présenter quelques avantages, spécialement pour l'Égypte, sans offrir de difficultés insurmontables ; mais pour les continents où les limites des pays sont si peu définies, il n'est guère facile d'indiquer celles des normes horaires et, du reste, il n'est pas indispensable de le faire maintenant. Ces limites se détermineraient d'elles même plus tard.

En Asie le 60me méridien oriental traverse Khiva. Bombay emploierait le 75me et Calcutta le 90me. Le 105me méridien oriental touche le royaume de Siam. Le 120me est près de Shang-haï, et le 135me traverse le Japon, et passe près de la Corée. Le 150me méridien de longitude occidentale est suffisamment près des îles Hawaïi.

En Australie les 150me, 135me et 120me méridiens de longitudes orientales sont admirablement situés pour servir respectivement d'unités horaires aux divisions orientale, centrale, et occidentale de ce continent.

Il n'y a aucune des localités ci-dessus mentionnées où les unités de temps proposées diffèrent de l'heure locale moyenne plus qu'elles ne

peuvent s'en écarter sans aucun dommage pour un intérêt important. Les convenances de la pratique basées, en majeure partie, sur la direction de rapports commerçiaux plus considérables, détermineraient la façon de procéder des populations qui n'ont pas été mentionnées et modifieraient probablement en quelque sorte la liste proposée.

Apparemment il n'existe pas de difficultés dans la pratique pouvant empêcher l'adoption du système des sections horaires pour marquer le temps. Les avantages de ce système sont amplement reconnus. Son adoption n'entraîne pratiquement aucune dépense. Il n'est pas besoin de changer le mécanisme et les cadrants des montres et des pendules. Il suffit de mettre les aiguilles sur la nouvelle heure et le résultat desiré est atteint.

Par l'adoption de ce système, les heures exactes, quoique différemment désignées dans les différentes sections pour l'usage quotidien, mais spécifiquement indiquées pour les besoins de la science, porteraient sur tous les points et au même instant la même désignation. Les minutes et les secondes coïncideraient partout. On pourrait donc déterminer, sans peine, l'heure absolue d'un événement quelconque.

Pour compter les méridiens horaires, on devrait commencer par celui où le jour commence, à la ligne de transition. Il arriverait alors qu'au moyen de l'électricité, le pendule d'une horloge ayant une situation centrale, pourrait régler l'heure locale de toutes les villes du monde entier.

Tableau des systèmes horaires qui règlent la manière de supputer le temps d'après les sections horaires.

Longitude comptée depuis Greenwich	Méridiens horaires.		Heures coïncidentes des différentes sections.
	Noms proposés pour les heures des différentes sections.	Numéro.	
Degrés.			
180	Heure de la ligne de transition	0 ou 24	12 minuit
165 long. ouest.	" de l'Alaska	1er	1 du matin
150 " "	" de Hawaiï	2me	2
135 " "	" de Sitka	3me	3
120 " "	" du Pacifique (adoptée aux États-Unis et au Canada)	4me	4
105 " "	" des Montagnes " "	5me	5
90 " "	" centrale (américaine) " "	6me	6
75 " "	" orientale (ou de la côte atl.) "	7me	7
60 " "	" de La Plata	8me	8
45 " "	" du Brésil	9me	9
30 " "	" de l'Atlantique central	10me	10
15 " "	" de l'Afrique occidentale	11me	11
0 " "	" internationale (employée dans la Grande-Bretagne.)	12me	12 midi
15 long. est	" continentale (employée en Suède.)	13me	1 après midi
30 " "	" du Bosphore	14me	2
45 " "	" de Caucase	15me	3
60 " "	" des Monts Ourals	16me	4
75 " "	" Bombay	17me	5
90 " "	" de l'Asie centrale	18me	6
105 " "	" de Siam	19me	7
120 " "	" de l'Asie orientale	20me	8
135 " "	" du Japan	21me	9
150 " "	" de l'Australie orientale	22me	10
165 " "	" de la Nouvelle Calédonie	23me	11

Toutefois, je n'ai pas le moindre désir de chercher à faire admettre par la Conférence la question du règlement du temps local. Mais, comme le système adopté dans les États-Unis et le Canada l'a été avec succès, et qu'il y est définitivement établi, j'ai crû devoir vous montrer les faits et la possibilité de l'adoption de ce système par tous les pays représentés à cette Conférence. Je retire par conséquent mon amendement.

M. RUTHERFURD, délégué des États-Unis. M. le délégué d'Italie a suggéré comme amendement à la première résolution par moi presentée, la cinquième résolution adoptée à la Conférence de Rome. Moralement et matériellement, il y a bien peu de différence entre elles, si ce n'est que la Conférence de Rome a spécifié que les objets qu'elle avait en vue, de soumettre à l'heure universelle, étaient, savoir:

Pour le service interne des grandes administrations des voies de communication, telles que celles de chemins de fer, lignes de bâteaux à vapeur, télégraphes et postes.

Maintenant, je prétends que dans ma résolution les termes embrassent tout ceci et beaucoup plus, car le jour universel doit être adopté "pour tous les besoins pour lesquels il sera trouvé convenable." S'il était indispensable que tous les besoins pour lesquels le jour universel peut être trouvé commode fussent détaillés, cela rendrait d'abord la résolution bien longue. Et de plus, on pourrait arriver à s'apercevoir que l'on a omis des cas pour lesquels il serait d'une utilité éminente. Il semble aussi que dans cette cinquième résolution on ne fait pas mention des questions de la chronologie de la date universelle, bien qu'elles aient été exposées et paraissent dans la sixième résolution. Je crois donc, M. le Président, qu'on ne gagnerait rien à adopter cet amendement, puisque tout ce qui y est compris l'est dans une bien plus grande étendue dans la résolution primitive.

M. le Général STRACHEY, délégué de la Grande-Bretagne. Comme explication à l'amendement présenté par M. le délégué d'Italie, permettez-moi d'appeler votre attention sur ce qui se passa à la Conférence de Rome. Avant tout, je trouve dans le rapport de la Conférence de Rome, au procès-verbal préliminaire (page 49) ces mots: "La *quatrième résolution*, en faveur d'une heure universelle pour certains besoins scientifiques et pratiques, est adoptée à l'unanimité."

Il n'y eut point de discussion, et on ne s'inquiéta pas comment elle serait définie ou exécutée. Maintenant, revenons au rapport du comité qui prépara les résolutions, et là nous voyons très bien à quoi il pensait en rédigeant cette résolution. Il est de toute évidence qu'il n'avait aucunement l'intention de lier les mains à qui que ce coit. Voici ce qu'il dit à la page 26 du rapport: "Les administrations des chemins de fer, des grandes lignes de bâteaux à vapeur, des télégraphes et de la correspondance postale, qui recevraient ainsi, pour leurs relations entre elles, un temps unique, excluant toute complication et toute erreur, ne pourraient cependant non plus séparer entièrement des heures locales dans leurs rapports avec le public. Elles se borneront probablement à employeur l'heure universelle dans leur service interne, pour les règlements de service, pour les horaires des conducteurs de train et des capitaines, pour les jonctions des trains aux frontières, etc.; mais les horaires destinés au public ne sauraient être exprimés qu'en heure locale ou nationale. Les gares des chemins de fer, les bureaux des postes et télégraphes pourraient avoir à l'extérieur et dans les salles d'attente, des horloges indiquant l'heure locale ou nationale, tandis que dans les bureaux on aurait, en outre, des horloges indiquant le temps universel. Les dépêches télégraphiques pourraient porter dans l'avenir l'heure de consignation et de réception, exprimée, à la fois, dans l'heure locale et dans l'heure universelle."

Maintenant, je dois avouer que le sujet de l'heure universelle est mieux traité dans la proposition de M. Rutherfurd que dans celle émanant du Congrès de Rome. Cette Conférence ne peut désigner d'une manière positive la meilleure manière de déterminer l'heure locale.

Ce qui nous intéresse le plus est l'heure universelle, bien qu'il serait utile que la résolution présentée concernant l'usage de l'heure universelle fut suivie par quelque chose de plus précis, comme ceci, par exemple:

V. La Conférence ne désignera pas le système par lequel l'heure locale peut le mieux être déterminée afin de conformer le plus possible à l'heure universelle, et celle ci serait déterminée par chaque nation, selon sa convenance.

VI. Les arrangements pour adopter l'heure universelle à l'usage des télégraphes internationaux devront être réglés par son Congrès.

Cette dernière idée a déjà été avancée dans cette Conférence par un délégué dont je ne me souviens pas du nom; et puisqu'il y a un congrès international appelé à régler tout ce qui concerne les télégraphes internationaux, on est en droit de croire qu'il le fera d'une façon satisfaisante.

L'amendement présenté par M. le délégué de l'Italie est mis aux voix, et les États suivants votent pour l'affirmative: Colombie, Espagne, Italie, Paraguay, Pays-Bas, Suède.

Les suivants votent pour la négative: Allemagne, Brésil, Chili, Costa-Rica, États-Unis, France, Grande-Bretagne, Gautémala, Hawaiï, Japon, Libérie, Mexique, Russie, Saint-Domingue, Salvador, Suisse, Turquie, Vénézuéla.

S'est abstenue: Autriche-Hongrie.

Pour, 6; contre, 18; abstention, 1.

Conséquemment l'amendement est rejeté.

On en revint alors à la proposition primitive.

M. RUTHERFURD, délégué des États-Unis. M. le Président, on m'a fait remarquer qu'il serait peut-être avantageux dans certains pays et dans différentes localités d'employer une heure qui ne pourrait pas être absolument définie comme heure locale.

Dans un lieu, le régulateur des heures pourrait être strictement l'heure locale; dans un autre, il pourrait être l'heure nationale; dans un troisième, l'heure des chemins de fer. Afin de satisfaire à ces conditions, je propose de changer les termes de la résolution primitive en insérant les mots "ou autre," de façon à ce qu'elle soit conçue comme suit:

"Qui ne devra pas empêcher l'usage de l'heure locale ou de toute autre qui paraîtrait désirable."

M. le Professeur ADAMS, délégué de la Grande-Bretagne. Ne serait-il pas mieux de s'exprimer ainsi: "qui n'empêchera l'usage de l'heure locale ou d'une autre heure normale qui paraîtrait désirable."

M. RUTHERFURD, délégué des États-Unis. J'accepte l'amendement de M. le délégué de la Grande-Bretagne.

M. JUAN VALERA, délégué d'Espagne. Comme je considère que l'amendement qui vient d'être rejeté et la proposition qui est maintenant soumise comportent la même chose au fond, je voterai pour la résolution, comme j'ai voté pour l'amendement il y a un instant.

M. le PRÉSIDENT. La question qui nous occupe maintenant, c'est la résolution modifiée, comme on va la lire.

On procède alors à la lecture de la proposition suivante:

La Conférence propose l'adoption d'une heure universelle pour tous les besoins pour lesquelles elle peut être trouvée convenable, et qui ne devra pas empêcher l'usage de l'heure locale ou d'une autre heure normale qui paraîtrait désirable.

Votent en faveur: Autriche-Hongrie, Brésil, Chili, Colombie, Costa-Rica, Espagne, États-Unis, France, Grande-Bretagne, Guatémala, Hawaiï, Italie, Japon, Libérie, Mexique, Paraguay, Pays-Bas, Russie, Salvador, Suède, Suisse, Turquie, Vénézuéla.

Pas de vote négatif.

Deux abstentions : L'Allemagne et Saint-Domingue.

La résolution est donc adoptée par vingt-trois voix et deux abstentions.

M. RUTHERFURD, délégué des États-Unis. M. le Président, je désire maintenant présenter l'autre partie de la proposition, ou plutôt je propose de présenter cette autre partie sous la forme d'une proposition distincte. Elle sera conçue en ces termes :

Le jour universel doit être un jour solaire moyen. Il devra commencer pour le monde entier à partir de minuit moyen du premier méridien coïncidant avec le commencement du jour civil et le changement de date sur ce méridien. Ce jour devra être compté de zéro à vingt-quatre heures.

Ceci est en substance la résolution adoptée par la Conférence de Rome, avec la différence que la Conférence de Rome proposa que le jour universel coïncidât avec le jour astronomique au lieu du jour civil et qu'il commençât à Greenwich à midi, au lieu de minuit.

M. le Professeur ADAMS, délégué de la Grande-Bretagne. Je demande à faire une simple remarque. Ne serait-il pas un peu plus correct si nous disions : "A partir de minuit moyen ?" Il me semble que j'ai déjà fait mention de ceci. Mais afin d'être clair, je crois qu'il nous faudrait faire ce changement.

M. Juan VALERA, délégué d'Espagne. M. le Président, je tiens à faire remarquer que la proposition qui est maintenant sous considération, et sur laquelle nous sommes appelés à voter, est d'une très grande importance.

Quant à moi, j'avoue que mon mandat est rempli. Le Gouvernement d'Espagne m'avait dit d'admettre la nécessité ou l'utilité d'un méridien initial commun, et aussi d'accepter le méridien de Greenwich comme méridien universel. J'ai rempli ces instructions.

Il s'agit maintenant d'une question scientifique sur laquelle je n'ose pas exprimer mon opinion, car je ne me reconnais pas les connaissances voulues et je ne suis pas revêtu de l'autorité nécessaire à cette fin. Cela est peut-être dû à mon ignorance dans ces matières, mais j'entrevois que des difficultés extraordinaires pourront surgir de l'adoption de cette proposition, et si nous procédons avec trop de précipitation, nous courrons le risque de nous mettre en contradiction avec le sens commun. Toutes les idées vulgaires des hommes, pendant des milliers d'années, pourront être bouleversées ; il pourra arriver que lorsque le jour commencera à Greenwich, Berlin sera vingt-trois heures en retard ; et que l'on prendra l'Orient pour l'Occident, et l'Occident pour l'Orient. Si nous faisions commencer le jour à l'anti-méridien toutes ces questions ne se seraient pas présentées, et nous penserions comme le reste de l'humanité. Cette question est donc très importante, et je crois qu'il vaudrait mieux suspendre la séance jusqu'à demain pour nous donner le temps de réfléchir ; de cette façon, nous ne nous exposerons pas, à force de vouloir être dévoués et fidèles à la science à encourir la critique du vulgaire.

Je propose donc que le vote sur cette question soit renvoyé à demain.

M. LEFAIVRE, délégué de France. Pas demain.

M. le Comte LEWENHAUPT, délégué de Suède. Je propose comme amendement la sixième résolution du Congrès de Rome, qui est comme suit :

La Conférence recommande, comme point de départ de l'heure universelle et des dates cosmopolites, le midi moyen de Greenwich, qui coïncide avec l'instant de minuit ou avec le commencement du jour civil sous le méridien situé à 12 h. ou à 180° de Greenwich.

Il convient de compter les heures universelles de 0 h. à 24 h.

M. le PRÉSIDENT. Nous croyons, comme M. le délégue d'Espagne, qu'il y aurait grand avantage à ajourner la question afin de nous donner le temps de la reconsidérer. Une motion pour ajourner la séance serait en ordre, mais avant qu'elle soit faite, le Président désirerait lire une lettre qui vient de lui être communiquée par le sous-Secrétaire d'État. La voici:

M. le Président des États-Unis recevra les membres de la Conférence jeudi, le 16 courant, à midi à la Maison Blanche.

Le sous-Secrétaire d'État propose que nous nous réunissions ici à midi moins le quart, et que de cette salle nous nous rendions à la Maison Blanche.

M. le PRÉSIDENT. Si M. le délégué d'Espagne voulait avoir la bonté d'ajourner sa motion pour un moment, M. le délégué de Suède désirerait présenter une proposition.

M. le Comte LEWENHAUPT, délégué de Suède. A l'avenir les discours faits, soit en français ou en anglais, seront envoyés aussitôt que possible aux délégués qui les ont prononcés et l'épreuve devra être corrigée et renvoyée sans délai à l'employé faisant fonction de Secrétaire. Aucune correction ne sera permise ultérieurement, à l'exception de celles faites par les Secrétaires de la Conférence, qui devront se réunir aussitôt que possible après que les corrections auront été insérées dans le texte imprimé, afin de préparer le protocole pour l'approbation de la Conférence.

La motion ayant été mise aux voix par le Président, est adoptée à l'unanimité.

M. le PRÉSIDENT. Nous voudrions communiquer d'une manière non-officielle une lettre que nous avons reçue aujourd'hui de Sir William Thomson, le savant distingué qui parla à la Conférence hier; et dans laquelle il exprime le regret de ne pas avoir dit au moment où il avait l'intention de le faire, que le méridien de Greenwich passe directement par le grand port commercial du Havre.

M. JANSSEN, délégué de France. Puisque M. le Président parle de ce sujet, je dois déclarer à mes collègues que j'ai reçu un télégramme de Sir William Thomson, dans lequel il me fait, en effet, des propositions à cet égard-là. Cependant, il n'est pas possible de savoir d'une manière précise, par ce télégramme, quelles sont les idées de Sir William Thomson. Tout ce que je puis dire, c'est que tout ce qui émane d'un homme aussi considérable doit être pris en très grande considération, et, par conséquent, je vois une raison de plus de demander à M. Thomson de vouloir bien m'expliquer ses idées. Si on pouvait ajourner jusqu'à lundi, je crois que ce serait beaucoup mieux; la préparation des protocoles est très arriérée, et il est désirable que les membres de la Conférence soient tenus au courant de la publication. Je suggérerais donc que la séance fut ajournée à lundi.

M. le PRÉSIDENT. Il y a plusieurs propositions d'ajournement. Le Président va les mettre aux voix par ordre et commencera par la motion d'ajournement à lundi.

Cette motion est adoptée, et la Conférence à quatre heures s'ajourne lundi à une heure de l'après-midi.

PROTOCOLE VI.

SÉANCE DU 20 OCTOBRE 1884.

La Conférence se réunit dans le Salon Diplomatique du Département d'État, à 1 heure de l'après-midi.

Sont présents :

Allemagne : M. le Baron von Alvensleben, M. Hinckeldeyn.
Autriche-Hongrie : M. le Baron Ignatz von Schæffer.
Brésil : M. le Dr. Luiz Cruls.
Chili : M. F. V. Gormas et M. A. B. Tupper.
Colombie : M. le Commodore S. R. Franklin.
Costa-Rica : M. Juan Francisco Echeverria.
Espagne : M. Juan Valera, M. Emilio Ruiz del Arbol, et M. Juan Pastorin.
États-Unis : M. le Contre-Amiral C. R. P. Rodgers, M. Lewis Rutherfurd, M. W. F. Allen, M. le Commandant W. T. Sampson, M. le Professeur Cleveland Abbe.
France : M. A. Lefaivre et M. Janssen.
Grande-Bretagne : Sir F. J. O. Evans, M. le Professeur J. C. Adams, M. le Lieutenant-Général Strachey, M. Sandford Fleming.
Guatémala : M. Miles Rock.
Hawaïï : Hon. W. D. Alexander.
Italie : M. le Comte Albert de Foresta.
Japon : M. le Professeur Kikuchi.
Libérie : M. W. Coppinger.
Mexique : M. Leandro Fernandez, M. Angel Anguiano.
Paraguay : M. le Capitaine John Stewart.
Pays-Bas : M. G. de Weckherlin.
Russie : M. C. de Struve, M. le Major-Général Stebnitzki, M. J. de Kologrivoff.
Saint-Domingue : M. de J. Galvan.
Suède : M. le Comte Carl Lewenhaupt.
Suisse : M. le Colonel Émile Frey.
Turquie : Rustem-Effendi.
Vénézuéla : Señor Dr. A. M. Soteldo.

Sont absents :

Danemark : M. C. S. A. de Bille.
Hawaïï : Hon. Luther Aholo.
Salvador : M. Antonio Batres.

M. le PRÉSIDENT. Il y a quelques jours le Président nomma, avec l'approbation de la Conférence, un *comité chargé d'examiner et de faire un rapport sur les communications adressées à la Conférence.* Toutes les communications qui ont été reçues, et elles sont assez nombreuses, ont toutes été renvoyées à cette commission, dont le délégué d'Angleterre, M. le Professeur Adams, est le président. M. le délégué d'Angleterre nous fait savoir qu'il est prêt à faire son rapport.

Le Professeur ADAMS lit le rapport suivant, qu'il fait précéder de la lecture d'une lettre adressée par le président de la Conférence au *comité des communications.*

CONFÉRENCE INTERNATIONALE,
Washington le 14 *octobre* 1884.

MONSIEUR : J'ai l'honneur de soumettre au comité, dont vous êtes le président, les communications suivantes :

1. Lettre de M. Roumanet de Cailland, transmise par M. Hunter, sous-Secrétaire d'État.

2. Lettre et communication de M. C. M. Raffensparger.
3. Lettre de M. A. S. B. de Chancourtois, accompagnée de brochures.
4. Lettre de M. J. W. Stolting de Dobbs' Ferry, incluse dans une lettre de M. A. R. Spofford.
5. Lettre de M. B. Aycrigg de Passaic, N. J.
6. Lettre de M. J. T. Field de Saint-Louis, Mo.
7. Lettre et deux documents inclus de M. Théodore Pesche.
8. Description de l'horloge universelle de M. A. M. Cory.
9. Lettre et un document de M. E. R. Knorr.
10. Lettre de M. J. E. Hilgard du Coast and Geodetic Survey des États-Unis.
11. Discussion du comité de New-York et de la succursale de New-Jersey et autres documents se rapportant aux poids et mesures.
12. Lettre de M. le Lieutenant C. A. S. Totten, U. S. A., concernant un méridien initial.
13. Lettre de M. J. P. Merritt concernant le système métrique.
14. Carte postale de M. W. H. Yates concernant la projection de Mercator.
15. Un système nouveau de mensuration par M. Lawrence S. Benson.
16. Lettre de T. C. Octman de Hope Mills, N. C., disant que le méridien de Greenwich passe par la ville du Havre.
17. Lettre de M. le Dr. H. K. Whitner qui explique sa méthode d'annoter les vingt-quatre heures.

Je suis, avec grand respect, votre obéissant serviteur,

C. R. P. RODGERS,
Président de la Conférence internationale.

Le comité nommé pour examiner les communications a l'honneur de faire le rapport suivant:

Après avoir examiné avec soin toutes les communications qui nous ont été transmises, comme elles sont énumérées dans la lettre de M. le Président Rodgers, nous sommes arrivés aux conclusions suivantes:

No. 1. Cette communication recommande l'adoption du méridien de Bethlehem pour méridien initial unique. La Conférence a déjà décidé cette question; il n'est donc plus nécessaire d'y revenir.

No. 2. Parle d'une invention pour laquelle l'auteur dit qu'il a sollicité un brevet d'invention, par conséquent le comité n'a pas d'opinion à exprimer à ce sujet.

No. 3. Cette communication, faite par M. de Chancourtois, est accompagnée d'un ouvrage dont il est l'auteur, lequel contient un programme détaillé d'un système géographique basé sur des mesures décimales du temps et des angles, et sur l'adoption d'un méridien initial international. Cet ouvrage contient aussi des notices historiques nombreuses sur le système métrique et sur le premier méridien.

Un exemplaire de cet ouvrage a été présenté à chacun des délégués avant les discussions de cette Conférence au sujet du choix d'un méridien initial, et par conséquent il semble au comité qu'un rapport spécial sur les vues de l'auteur touchant cette matière serait superflu. Ces vues sont presque identiques à celles qui ont été si habilement défendues devant la Conférence par M. Janssen, mais qui, cependant, n'ont pas été approuvées.

L'auteur propose aussi de remplacer la méthode de mesurer les angles et le temps par un système où la circonférence entière du globe et la longueur du jour doivent d'abord être devisées chacune en quatre parties égales, chacune de ces parties devant ensuite être subdivisée décimalement.

Quelles que respectables que soient ces propositions en thèse générale, le comité est décidément d'avis qu'elles ne sont pas comprises dans les limites indiquées par les instructions que nous avons reçues de nos gouvernements respectifs, et que par conséquent leur discussion serait d'une nature purement académique. C'est pourquoi le comité pense qu'il serait fort peu à désirer que la Conférence s'en occupât.

No. 4. Une lettre de M. Spofford, bibliothécaire du Congrès des États-Unis, par laquelle il transmet une communication de M. J. W. Stolting, de Dobbs' Ferry (N. Y.). L'auteur recommande l'adoption pour méridien initial de celui qui est situé à 162 degrés à l'ouest de Greenwich; il propose de ne pas dire est et ouest, mais de dire la première et la seconde moitié; il recommande en outre l'adoption d'une heure universelle, qui ne soit pas en conflit avec l'heure locale ou avec une autre heure normale et de compter depuis 1 jusqu'à 24. Il n'exprime point d'opinion sur la question de savoir si le jour doit commencer à midi ou à minuit. Il semble qu'il n'y ait rien dans cette communication qui soit de nature à influer sur les décisions de la Conférence.

No. 5. Voyez le rapport au sujet de la lettre numéro 1.

No. 6. L'auteur propose que le premier méridien soit à 180° de Greenwich, et que la longitude soit calculée de 0° à 360°. Cette proposition a déjà été considérée et rejetée par la Conférence.

No. 7. Cette communication propose "que l'on adopte comme premier méridien la ligne limitrophe entre la Russie et les États-Unis, telle qu'elle est définie par le traité du 30 mars 1867."

Comme le premier méridien a déjà été choisi par la Conférence, cette proposition ne réclame pas d'autre observation.

No. 8. Cette communication a rapport à une invention qui n'a aucun rapport avec la question devant la Conférence. Par conséquent le comité s'abstient d'exprimer une opinion au sujet de son mérite.

No. 9. Deux lettres de la part de M. E. R. Knorr, de Washington, D. C., soutenant l'utilité de compter la longitude " vers l'ouest, de 0° à 359° et de la marquer sur les cartes, par heures au lieu de degrés. La Conference a déjà pris une décision à ce sujet.

No. 10. Une lettre du Professeur Hilgard, renfermant une brochure de C. A. S. Totten, sur la métrologie de la grande pyramide, sujet qui ne rentre pas dans les questions soumises à la considération de cette Conférence. Dans cette lettre le Professeur Hilgard dit:

> Je suis purement et carrément pour le minuit de Greenwich, et en faveur de la supputation de l'est à l'ouest, c'est-à-dire, 180° de chaque côté.

No. 11. L'auteur se prononce en faveur du système des poids et mesures Anglo-Saxon. Ce sujet étant étranger aux questions soumises à la considération de cette Conférence, le comité ne juge pas nécessaire de s'en occuper.

No. 12. Une lettre du Lieutenant C. A. S. Totten, U. S. A., dans laquelle il s'exprime en faveur d'un premier méridien passant par la grande pyramide. Cette question a déjà été décidée par la Conférence.

No. 13. L'auteur recommande une nouvelle distribution du temps d'après le système décimal. Ainsi qu'il a déjà été dit au No. 3, cette proposition est clairement en dehors des limites indiquées par les instructions que nous avons reçues de nos gouvernements respectifs.

No. 14. L'auteur déclare qu'il a un plan par lequel "les chronomètres peuvent indiquer la longitude uniformément." Cette proposition est étrangère aux sujets soumis à la considération de la Conférence.

No. 15. L'auteur propose un nouveau système de mesurage; et par conséquent, ceci ne rentre pas dans les limites des sujets soumis à l'attention de la Conférence.

No. 16. Cette communication propose que, comme le premier méridien passe par le Havre, il soit permis de l'appeler par ce nom. Le comité recommande que le premier méridien ne soit pas appelé d'après les localités qu'il traverse, mais qu'il soit nommé plus simplement "premier méridien."

No. 17. Étant l'objet d'un brevet de patente, le comité ne croit pas être appelé à émettre une opinion.

Ce rapport est respectueusement soumis à la Conférence.

J. C. ADAMS,
Président du Comité sur les Communications.

M. RUTHERFURD, délégué des États-Unis. Je propose d'accepter le rapport et d'en adopter les conclusions.

Aucune objection n'étant faite, le rapport est adopté.

M. le PRÉSIDENT. D'après l'ordre du jour d'aujourd'hui, le premier sujet soumis à la Conférence est la proposition présentée par le délégué des États-Unis, M. Rutherfurd, avec l'amendement proposé par le délégué de Suède, M. le Comte Lewenhaupt.

La proposition est conçue en ces termes:

Le jour universel doit être un jour solaire moyen. Il devra commencer pour le monde entier à partir de minuit moyen du premier méridien coïncidant avec le commencement du jour civil et de la date sur ce méridien, et devra être compté de zéro à vingt-quatre heures.

L'amendement proposé est ainsi conçu:

La Conférence recommande comme point initial de l'heure universelle et du jour cosmique le midi moyen de Greenwich, coïncidant avec le moment de minuit ou du commencement du jour civil sur le méridien situé à 12 heures ou 180 degrés de Greenwich.

Les heures universelles devront être comptées à partir de 0 jusqu'à 24 heures.

Je suis d'avis que l'amendement de M. le délégué de Suède doit être d'abord discuté.

M. JANSSEN, délégué de France. Dans la dernière séance, je faisais connaître à l'assemblée que j'avais reçu un télégramme de Sir William Thomson sur la question du méridien. Depuis, l'illustre associé étranger de l'Institut de France a bien voulu m'écrire une lettre très amicale sur ce sujet, où il exprime tout d'abord sa sympathie pour l'attitude désintéressée prise par la France dans ce Congrès. Je remercie Sir William de ses sentiments pour la France, et je suis persuadé qu'avec un esprit aussi supérieur on arriverait à une entente sur des bases scientifiques où les intérêts moraux et matériels de tous seraient équitablement ménagés, ainsi que nous l'avons toujours entendu.

Mais la question n'est pas ouverte en ce moment, et cette assemblée ne serait sans doute pas disposée à la rouvrir. Sir William Thomson comprendra donc que dans la situation actuelle nous n'avons qu'à maintenir l'attitude que nous avons prise et les votes que nous avons donnés.

M. le PRÉSIDENT. Le Président fera simplement remarquer à la Conférence qu'il n'a fait allusion à la lettre qu'il avait reçue de Sir William Thomson, que d'une manière non-officielle. Le Président ajoutera en outre, en réponse à M. le ministre d'Espagne, que la règle de cette Conférence (règle qui lui semble très simple) est que l'amendement présenté en dernier est celui à discuter et à considérer et non, comme l'a suggéré M. le délégué d'Espagne, le plus important par son caractère. Il serait assez difficile au Président de décider dans toutes les occasions quel amendement est le plus important. C'est pourquoi je pense, comme Président, de continuer à observer la règle en vigueur dans ce pays, et à moins que la Conférence n'en veuille décider autrement le Président présentera l'amendement proposé en dernier lieu.

M. RUIZ DEL ARBOL, délégué d'Espagne. M. le Président, le ministre d'Espagne n'a pas fait allusion à l'amendement le plus important, mais au plus radical. Par exemple, nous voici en présence de plusieurs propositions sur l'adoption d'un méridien; l'une d'elle doit être prise en

considération, et il me semble que mon amendement, qui est le plus radical, est de fait le premier qui devrait être présenté à la Conférence.

M. le PRÉSIDENT. A moins que la Conférence n'en décide autrement, le Président se croit obligé d'agir selon le principe qui l'a guidé jusqu'à présent, c'est-à-dire, de présenter les amendements à la Conférence dans l'ordre inverse où ils ont été présentés. En conséquence, la proposition à discuter est l'amendement présenté par le délégue d'Espagne, M. Arbol, qui est conçue en ces termes:

Ayant adopté le méridien de Greenwich pour compter les longitudes comme une nécessité générale pour des besoins pratiques, mais pensant que l'introduction de n'importe quel nouveau système de déterminer l'heure est de beaucoup plus scientifique, plus important, plus sujet à de grandes difficultés, et à la confusion dans l'avenir, nous proposons la résolution suivante:

La Conférence, prenant en considération qu'il existe déjà un méridien tacitement adopté par la plupart des nations civilisées comme l'origine des dates, à savoir, l'anti-méridien de Rome, s'abstient de désigner tout autre méridien pour déterminer l'heure universelle.

M. RUIZ DEL ARBOL, délégué d'Espagne. On propose d'introduire un système unique, universel ou cosmopolite, de calculer l'heure, qui serait, on l'espère, généralement appliqué dans un temps plus ou moins éloigné, non seulement aux besoins scientifiques, mais encore aux besoins ordinaires de la vie civile, quand il serait possible de s'en servir, et en outre, on propose de désigner un méridien à partir duquel ce calcul de l'heure cosmopolite commencerait. Ce que j'ai à constater, c'est que cette méthode de calcul unique de l'heure existe déjà (quoique nous ne nous en servions pas), aussi bien que le méridien universel qui a été tacitement choisi par presque toutes les nations civilisées, c'est-à-dire, par toutes celles qui ont adopté le calendrier Julien, avec ou sans la correction Grégorienne. Ainsi la moindre modification du système actuel ne comporte rien moins qu'une réforme chronologique que je ne suis pas certain qu'il soit bon d'introduire ou de recommander, et que je doute même qui puisse être reçue avec une approbation unanime ou cordiale. De fait, Messieurs, toutes les nations qui ont adopté les systèmes Grégorien et Julien de calculer l'heure en ont nécessairement accepté les conséquences, et ces conséquences sont, comme Rome nous l'a dit du temps de César et de Grégoire XIII, que nous devons calculer toujours à partir de telle ou telle date. Mais comme Rome admet que les pays situés à l'est devaient déterminer cette date en avance sur elle, et les pays à l'ouest en retard sur elle, il est évident que ces deux déterminations de date devaient se rencontrer à un certain point et sur un certain méridien qui était et ne pouvait être autre que l'anti-méridien de Rome. La nature elle-même semble avoir approuvé ceci, puisque l'anti-méridien de Rome ne traverse aucun continent et probablement aucune terre.

Supposons, par exemple, que l'on se soit entendu pour abandonner à un moment donné le système Grégorien et en adopter un autre; que l'on se soit entendu pour l'abandonner sur tous les points du globe quand il serait midi à Greenwich, le premier janvier 1885; et supposons, en outre, que pour les besoins historiques et scientifiques nous ayons intérêt à connaître exactement depuis combien de temps on se sert du système Grégorien. Est-il possible de le savoir? Oui, et très facilement. En se servant du système universel de calculer les heures que l'on se propose d'établir, mais en les rapportant logiquement à l'origine de ce calcul des heures cosmopolites, qui existe réellement, c'est-à-dire, à l'anti-méridien de Rome, nous découvrirons ainsi que l'on a compté 1885 années selon le système Grégorien, plus la différence de longitude entre les anti-méridiens de Greenwich et de Rome. Il n'y a rien de plus certain que ceci, et il n'y a pas d'autre moyen de résoudre le problème.

Comme je l'ai déjà prouvé, quand la correction Grégorienne fut faite, le jour qui selon l'ancienne manière aurait été le 5 octobre, fut appelé le 15 octobre 1582; les pays situés à l'est de Rome avaient cependant commencé antérieurement à compter selon le nouveau système (antérieurement, en temps absolu, je veux dire), et par la suite les pays situés à l'ouest l'adoptèrent successivement.

Maintenant donc, comme cette partie du globe qui se trouve à l'est d'un point donné quelconque ou méridien, n'est rien de plus ou de moins qu'un hemisphère, et que celle qui se trouve à l'ouest est un autre hémisphère, il est de toute évidence, que, à l'anti-méridien de Rome, les deux méridiens, qui diffèrent constamment d'un jour dans leurs dates, se confondent, et que l'anti-méridien de Rome, étant le premier du monde qui adopta les systèmes Grégorien et Julien de compter, est le premier méridien du monde, le méridien par lequel nous calculons maintenant, et par lequel nous devrions déterminer l'heure universelle, jusqu'à l'etablissement d'une méthode différente. Si nous avions, de nos jours, à résoudre une question quelconque dépendant des dates, dans une région où existe quelque confusion apparente, nous devrions procéder ainsi selon ce principe. Si nous désirions forcer le monde entier à tenir un compte régulier et logique des dates, nous ne le pourrions qu'en forçant toutes les nations à l'ouest de l'anti-méridien de Rome de continuer à compter leurs dates, sans interruption, après qu'on eût commencé à les compter au dit anti-méridien, et en interdissant à toutes les nations à l'est de compter une date jusqu'à ce qu'elle ait été déterminée à l'anti-méridien de Rome. Pour cette raison, je dis que la désignation expresse, en vue de déterminer l'heure universelle du méridien de Greenwich ou de tout autre que l'anti-méridien de Rome, comporte une réforme chronologique, parce que cela peut entraîner l'abandon du système auquel nous adhérons maintenant, et que nous employons par un commun accord.

Cette réforme occasionnera un changement de 13 heures à peu près, c'est-à-dire, de 12 heures plus la différence de la longitude qui existe entre Rome et Greenwich, si le méridien de Greenwich est désigné comme le nouveau point initial de la date universelle; toutefois je n'ai pas lieu de croire, que vous ferez irrévocablement ce choix, puisque ses conséquences curieuses et étranges peuvent être démontrées par un exemple, que je tiens à citer: cette table est d'une grandeur à peu près suffisante pour nous permettre d'apprécier et d'observer la différence à ses deux extrémités de la longitude géographique. Supposons que ces séances aient lieu à Greenwich et que la table soit placée d'est en ouest de façon que le méridien la coupe dans la longueur; de plus, supposons que nous nous soyons entendus de calculer la nouvelle heure universelle par ce méridien, c'est-à-dire, par celui de Greenwich, et que, en signant le protocole, nous désirions, afin de donner un exemple au monde en employant la date universelle, la date civile actuelle et la date civile future, que, par l'emploi quotidien de la date universelle, les nations puissent ou pourraient finalement accepter, à l'exclusion des autres, pour les besoins ordinaires de la vie. Par là donc, Messieurs, nous ferions tomber notre choix en discrédit. Nous ne pourrions signer selon ces trois dates. Quant à la dernière nous trouverions que la moitié de la table et la moitié du Congrès étaient sous une date, et l'autre sous une autre, même si notre Président se trouvait assis au milieu, il s'apercevrait qu'il présidait à nos sessions avec son côté droit dans un jour, et son côté gauche dans l'autre. On peut me dire que ceci arriverait, quelque fût le méridien choisi, mais nous pourrions permettre que cela se fit en mer ou dans quelque région isolée et inhabitée où les Congrès ne siègent jamais, et où jamais le moindre rayon de civilisation ne pénètre.

Mais pour en revenir à la réforme, qu'allez-vous faire? Je dirai que, si, au lieu du méridien de Greenwich, vous désignez l'anti-méridien pour compter l'heure universelle, et comme point initial des dates cosmopolites pour le présent, et à l'avenir, comme point initial aussi des dates locales, la valeur de la réforme ne se monterait qu'à peu près à une heure, mais ce serait encore là une réforme. En un mot, l'anti-méridien de Rome est celui qui fournit aujourd'hui des dates pour le monde entier, et vous, vous proposez qu'à l'avenir ce soit le méridien de Greenwich ou l'anti-méridien.

Je vous dis donc, si vous désirez une heure commune pour les besoins de la poste et du commerce, ne désignez aucun méridien, que les compagnies de chemin de fer et de télégraphes, les autorités postales et les Gouvernments fassent un arrangement et choisissent une heure artificielle, si je puis m'exprimer ainsi, que ce soit l'heure de Rome, de Londres, de Paris, ou même celle de Greenwich, mais ne faites pas une déclaration prématurée et formelle comme émanant de ce Congrès; une réforme apparemment insignifiante, mais en réalité une de très grande importance, puisque, en donnant la préférence à des localités déterminées en dépit de ce qui est scientifique, historique et logique, vous rendez difficile à l'avenir l'adoption de cette même réforme, qui sera, peut-être, alors plus nécessaire, et qui alors pourra être probablement introduite avec plus d'intelligence.

Vous voyez que je ne parle en faveur d'aucun méridien spécial, pas même de celui de Rome, puisque j'admets que la réforme pourrait être nécessaire. Vous voyez, et je vous l'assure que je n'ai pas le moindre désir que le méridien qui doit être le point initial de l'heure universelle porte le nom d'un observatoire ou d'un endroit quelconque d'Espagne, quoique cette nation ait découvert le Nouveau Monde dans lequel ce Congrès tient aujourd'hui ses séances, et quoique l'on puisse dire de cette nation qu'elle ait découvert ces mêmes méridiens dont nous parlons en ce moment, si l'on considère que les méridiens terrestres étaient des lignes indéfinies et inconnues, et étaient même sans forme, jusqu'à ce qu'il leur en fut donné une par Sebastian del Cano et j'espère que, si vous ne me faites pas l'honneur d'accepter ma proposition, qu'au moins vous me rendrez justice à mes intentions.

M. le Professeur ADAMS, délégué de la Grande-Bretagne. M. le Président, je serai bref dans les quelques remarques que je pourrais faire au sujet de la proposition qui nous occupe.

Autant que je la comprends, c'est que, quoique nous ayons adopté le méridien de Greenwich comme premier méridien à partir duquel on doit compter la longitude, on devra commencer à compter le temps selon le méridien de Rome. Je ne puis consentir à cette proposition. Il me semble qu'il lui manque tous les éléments de la simplicité, et la simplicité doit être notre but principal dans cette Conférence. Compter la longitude à partir d'un méridien, et le temps à partir d'un autre, est un moyen qui ne sera jamais adopté.

Je n'ai pas du tout compris que cela soit la proposition recommandée par la Conférence de Rome. Au contraire, je crois qu'elle est tout à fait différente.

M. RUIZ DEL ARBOL, délégué d'Espagne. M. le Président, je ne me propose pas en réalité d'adopter le méridien ou anti-méridien de Rome.

Ce que je soutiens, c'est que nous devrions nous abstenir pour le moment d'adopter aucun méridien comme point de départ pour les calculs de temps ; autrement nous introduirons un nouvel élément de confusion pour l'avenir. Nous changerions la manière chronologique de compter qui est aujourd'hui universelle, et je maintiens que nous n'avons aucun

droit scientifique ou historique de faire ce changement maintenant; à mon point de vue le méridien de longitude n'est qu'une affaire de peu d'importance. Elle est pratique néanmoins; le méridien ne pourrait pas être changé avant vingt ans probablement, et cela prendra tout ce temps pour corriger toutes les cartes.

Mais si vous adoptez un méridien de temps il sera bien difficile de le changer à l'avenir. Je ne puis pas maintenant entrevoir qu'elles pourraient être les difficultés, mais je crains que l'application de ce nouveau principe aux nombreux détails des choses scientifiques et civiles sera nécessairement accompagnée de grands inconvénients, et que peut-être il sera démontré qu'elle n'est pas pratique.

Je comprends parfaitement qu'on se propose de n'appliquer ce principe qu'en certains cas, et qu'il n'est adopté qu'afin d'éviter tout danger dans les communications, dans la navigation, les chemins de fer, l'envoi des télégrammes, etc., mais ceci n'est purement qu'une affaire d'administration et peut être réservée à d'autres corps délibérants.

M. le PRÉSIDENT. Le Président désire rappeler respectueusement au délégué d'Espagne, M. Arbol, qu'à sa dernière séance la Conférence résolut à une singulière unanimité, qu'il serait utile d'adopter "un jour universel pour tous les besoins auxquels il conviendrait, et qui ne nuirait pas au temps local ou à tout autre unité de temps où celle-ci sera désirable." Le Président fait poliment remarquer que le sujet qui est pour le moment en discussion est l'adoption de la proposition recommandée par la Conférence de Rome et qui est présentée ici par le délégué de Suède, M. le Comte Lewenhaupt.

M. RUIZ DEL ARBOL, délégué d'Espagne. Ma proposition consiste à s'abstenir sur l'adoption de n'importe quel méridien, et de laisser la chose à décider par un Congrès organisé tout spécialement pour ce but.

M. le Commandant SAMPSON, délégué des États-Unis. M. le Président, autant que je puis comprendre M. le délégué d'Espagne, il paraît beaucoup appréhender que par l'adoption d'un jour universel, qui a été proposée ici, il nous faudrait ou gagner ou perdre du temps dans nos tables chronologiques, et qu'il nous faudrait sauter 12 heures en plus ou en moins. Mais sans doute tel n'est point le cas. Un événement quelconque, qui est arrivé ou qui arrivera au moment de l'adoption du jour universel adopté, sera exprimé avec autant d'exactitude, quant au temps, que si le temps avait été calculé à partir de l'ère chrétienne. Non seulement, il n'y aura pas de confusion, mais il me semble que l'adoption du jour universel ne fera que tendre à éviter les confusions désormais, car la confusion doit exister là où nous avons tant d'unités de temps. Maintenant, un événement quelconque qui a lieu ou qui a eu lieu à une époque quelconque de l'histoire du monde, s'il se rapporte au méridien, est exprimé en temps d'une ou de plusieurs localités, est bien différent.

Or l'adoption d'un jour universel est à seule fin d'éviter toutes difficultés de ce genre, et un événement quelconque qui s'est passé représentera, s'il est exprimé en temps universel, représentera, dis-je, exactement l'intervalle de temps qui s'est écoulé depuis le commencement de l'ère chrétienne. Rien n'est ni gagné ni perdu.

M. le Général STRACHEY, délégué de la Grande-Bretagne. Il me semble que la Conférence ayant approuvé la résolution à laquelle il a été fait allusion il y a quelques instants, en adoptant le jour universel, il en résulte que c'est à nous qu'il incombe de déterminer quand doit commencer ce jour universel. La résolution présentée par le délégué des États-Unis propose de définir comment ce jour universel doit être

calculé; c'est-à-dire, quand il doit commencer et comment devront être comptées les heures dont il se compose.

Le même délégué a expliqué que la différence entre sa proposition et celle qui a été formulée à Rome, consistait à changer l'heure à laquelle doit commencer le prétendu jour universel de midi à Greenwich, pour le commencement du jour civil. Ce que le Commandant Sampson vient de dire est évidemment très vrai.

L'adoption de ce prétendu jour universel n'apportera aucune perturbation dans les actes de la vie civile. Les deux buts que l'on veut atteindre sont entièrement distincts entre eux. Il est hors de doute que l'idée de la nécessité d'avoir un jour universel est née de la pensée suggérée par ce fait que l'heure est essentiellement locale; que l'heure sur une ligne donnée quelle qu'elle soit (supposons que ce soit un méridien) n'est pas identique au même moment sur les deux côtés de cette ligne, si minime que soit la différence; et afin d'obtenir une exactitude scientifique on a donc jugé opportun d'avoir un type absolu pour déterminer les jours et les heures. Jusqu'à présent on a eu coutume de dire, d'une façon indéfinie, qu'un événement a eu lieu, supposons, le 1er janvier à 6 heures du matin, cette indication de l'heure a paru suffisante; mais, en réalité, cet énoncé n'établit pas une période définie du temps, car si l'événement a eu lieu à Madrid et qu'il ait été signalé de cette façon, ce rapport ne désignerait pas le même instant qui marquerait un événement désigné comme ayant eu lieu précisément à la même date et à la même heure à Greenwich, à Rome ou à Washington. Ce dont on a besoin et ce que l'on désire, c'est d'avoir un type absolu et défini pour calculer des événements d'une certaine nature à l'égard desquels une précision absolue est à désirer. Je prétends donc que le délégué d'Espagne nous égare par la proposition qu'il a présentée, et par laquelle il insinue en fait d'annuler la proposition déjà adoptée. Nous avons déjà décidé qu'un jour universel était utile, il incombe à la Conférence de décider maintenant quand doit commencer ce jour universel.

M. Ruiz del Arbol, délégué d'Espagne. Je crois que les conséquences ne seriont peut-être pas accompagnées de difficultés au début; mais qui donc pourrait chercher à voir dans l'avenir et prévoir dans quels embarras nous pourrons tomber si nous prenons le méridien de Greenwich comme type de l'heure? Chaque pays sera contraint de compter dans les deux sens. Il leur faudra employer l'heure civile et l'heure universelle. Ces pays s'accoutumeront peut-être tôt ou tard à ce changement radical, mais nous n'en pouvons pas prévoir dès à présent les difficultés. J'ai sous les yeux un traité (un livre) de "Chronologie analytique"; il donne la formule destinée à établir l'accord entre les dates diverses des différents calendriers et des époques diverses, j'ignore jusqu'à quel point l'heure universelle pourra les affecter; mais il est inutile de m'étendre sur ce sujet qui vous est sans doute familier.

M. Juan Pastorin, délégué d'Espagne. Le Congrès a déjà approuvé de très importantes décisions au sujet de la supputation des longitudes, et il approuvera aussi certainement celles qu'on vient de soumettre aujourd'hui à sa considération au sujet du jour universel.

Je dis certainement, parce que le résultat des votes antérieurs étant déjà connu, on ne peut douter de quel côté se trouve la majorité; et parce que, au point de vue scientifique, ayant choisi Greenwich comme méridien initial des longitudes, et ayant accepté que celles-ci devront se compter en deux directions de 0 h. à 12 h. avec les signes plus vers l'est et moins vers l'ouest, il serait avantageux d'accorder aussi que le jour civil de Greenwich coïncidât avec le jour universel, si l'on veut trouver une formule facile pour passer du temps local au temps cosmique.

Toutes les résolutions soumises au Congrès par M. Rutherfurd, ayant été approuvées les unes après les autres, le plan que notre collègue avait préalablement étudié sera accepté dans son ensemble; mais il sera impossible de connaître dans tous leurs détails d'autres plans qui, peut-être, n'auraient pas été moins dignes d'attention.

Eh! bien, la résolution adoptée par la majorité du Congrès sera-t-elle la meilleure? Serons-nous arrivés au but de la réforme en complète harmonie avec les aspirations de toutes les puissances ici représentées? Dans l'hypothèse contraire, il me semble que les séances de cette Conférence ne seront qu'un pas de plus vers cette réforme mais non pas la réforme même.

Si la majorité du Congès, d'accord avec la conséquence logique de ses travaux, adoptait comme temps cosmique le temps civil de Greenwich, cette décision serait en désaccord avec les idées les plus anciennes du genre humain. Depuis plusieurs siècles on a compté les dates à partir de l'orient, et on ne saurait admettre que le monde abandonnerait facilement les traditions de ses ancêtres.

La date civile du globe commence à peu près à l'anti-méridien de Rome, Greenwich ou Paris. Par conséquent, il n'est pas naturel qu'aucun de ces méridiens soient choisis comme point de départ d'une date.

En réalité, un phénomène ne peut pas être le commencement d'une série de phénomènes s'il en est un autre qui le précède périodiquement.

Si la majorité, suivant la logique, adopte de même la formule: "temps cosmique = temps local — longitude," et applique au calcul les longitudes avec les signes plus et moins, selon que la longitude est orientale ou occidentale, le système peut être la source d'erreurs fréquentes, et celles-ci, à leur tour, pourraient être la cause d'accidents désastreux, surtout sur les chemins de fer.

Supposons, en outre, que le 31 décembre, il soit trois heures à un point situé à neuf heures à l'est de Greenwich. A ce moment, on comptera à Greenwich dix-huit heures civiles du trente du même mois, d'après la manière actuelle de supputer la date civile, et ce temps civil de Greenwich sera le temps cosmique.

Appliquons à l'exemple proposé la formule qui sera acceptée, je suppose par la majorité du Congrès, et le résultat sera une quantité négative—moins six heures, résultat peu compréhensible par lui-même et d'une application très difficile pour être facilement admise par le public en général.

Est—ce qu'une majorité peut convaincre dans des questions comme celles que nous traitons simplement par la force du nombre?

Le monde entier, pendant plusieurs siècles, a cru que la terre était le centre de notre système planétaire. Jusqu'au jour où la voix d'une insignifiante minorité s'éleva contre la théorie considérée depuis long temps comme indiscutable par ses ancêtres.

Je finirai en exprimant mon opinion sur le sujet dont le Congrès s'occupe. Mon opinion n'est pas nouvelle, malgré qu'elle ait été modifiée dans le cours de nos séances. Les travaux de notre savant collègue et infatigable propagateur, M. Sandford Fleming, les résolutions de la Conférence de Rome, les respectables opinions de Messieurs Faye, Otto Struve, Beaumont de Boutillier, Hugo Gylden, le travail scientifique de M. Chancourtois, et le rapport que M. Gaspari vient de présenter à l'Académie des sciences de Paris, sont les textes où j'ai appris que la manière la plus simple et la plus pratique de résoudre le problème est d'adopter comme premier méridien pour le temps cosmique et les longitudes un méridien qui soit à peu près le point du changement de nos dates actuellement et de compter les longitudes de 0 *h.* à 24 *h.* vers

l'occident en sens contraire à celui du mouvement de la terre. La formule serait alors :

Temps cosmique = temps local + longitude.

Je considère que le meilleur moyen de trouver le temps cosmique en rapport avec le temps local et la longitude est d'ajouter une quantité à l'heure civile de chaque point du globe.

Mais vu que la majorité de ce Congrès, si digne de respect, n'admet pas de modifications au système que nous pouvons appeler Greenwich, mettons de côté les longitudes et considérons séparément le temps cosmique.

En conséquence, j'ai l'honneur de présenter les résolutions suivantes, et je prie le Congrès de vouloir bien les étudier et de les accepter comme moyen de conciliation.

La Conférence propose aux Gouvernements ici représentés l'adoption des résolutions suivantes :

1°. Il convient de choisir comme méridien initial pour le temps cosmique, celui où commence à peu près, aujourd'hui, la date civil du monde : savoir, l'anti-méridien de Greenwich ou du Havre.

2°. Le jour cosmique est de 24 heures, et commence à minuit du méridien initial.

3°. La surface de la terre est divisée, à partir du méridien initial, par 24 méridiens horaires, et ceux-ci numérotés corrélativement de 0 à 24, en sens contraire à la rotation terrestre.

Ainsi la formule sera :

Temps cosmique = temps local + R, dans cette formule le mot R (ou retard) représente la différence, comptée de 0 *h.* à 24 corrélativement, entre le temps local du méridien initial pour le temps cosmique, et le temps local de chaque point du globe.

Le PRÉSIDENT. Nous prions le délégué d'Espagne, M. Pastorin, de nous dire s'il présente cette proposition comme amendement à celle de son collègue, M. Arbol.

M. RUIZ DEL ARBOL, délégué d'Espagne. M. le Président, le dernier amendement présenté n'a pas pour but de modifier ma proposition.

Le PRÉSIDENT saisit alors la Conférence de l'amendement présenté par le délégué d'Espagne, M. Arbol.

Après avoir été mis aux voix, l'amendement est rejeté.

Le PRÉSIDENT. La question à décider maintenant se rapporte à l'amendement soumis par le délégué d'Espagne, M. Pastorin. Cet amendement est comme suit :

1°. Il convient de choisir comme méridien initial pour le temps cosmique, celui où commence à peu près, aujourd'hui, la date civil du monde : savoir, l'anti-méridien de Greenwich ou du Havre.

2°. Le jour cosmique est de 24 heures, et commence à minuit du méridien initial.

3°. La surface de la terre est divisée à partir du méridien initial, par 24 méridiens horaires, et ceux-ci numérotés corrélativement de 0 à 24, en sens contraire à la rotation terrestre.

Ainsi la formule sera :

Temps cosmique = temps local + R, dans cette formule le mot R (ou retard) représente la différence, comptée de 0 *h.* à 24 corrélativement, entre le temps local du méridien initial pour le temps cosmique, et le temps local de chaque point du globe.

Le PRÉSIDENT. Pour que cet amendement puisse être plus clairement présenté à la Conférence, je propose que la séance soit suspendue pendant quelques minutes.

Aucune objection n'ayant été soulevée, la séance est suspendue.

A la reprise de la séance, le PRÉSIDENT déclare que si personne ne présente de nouvelles observations il sera procédé au vote sur la proposition soumise par le délégué d'Espagne, M. Pastorin.

Aucune objection n'ayant été soulevée, il est procédé au vote sur l'amendement, qui est repoussé.

Le PRÉSIDENT. La question à décider maintenant se rapporte à la proposition présentée par le délégué de Suède, M. le Comte Lewen-

haupt, dont lecture sera donnée à nouveau. La proposition est comme suit:

La Conférence recommande comme point initial de l'heure universelle et du jour cosmique, le midi moyen de Greenwich, coïncidant avec le moment de minuit ou du commencement du jour civil sur le méridien situé à 12 heures ou 180 degrés de Greenwich.

Les heures universelles devront être comptées à partir de 0 jusqu'à 24 heures.

M. le Professeur ADAMS, délégué de la Grande-Bretagne. M. le Président, mon intention était de parler au sujet de la proposition présentée par le délégué des États-Unis, M. Rutherfurd, mais les observations que j'ai réunies s'appliquent également à l'amendement relatif à cette proposition, amendement présenté par le délégué de Suède, et qui est identique à l'une des recommendations de la Conférence de Rome, attendu que, en somme, mes observations traitent alternativement ces mêmes propositions. En conséquence, si vous le permettez, je présenterai les observations que je désire faire.

Qu'il me soit permis d'exprimer mon entière approbation au sujet de la proposition soumise à la Conférence par M. Rutherfurd.

Cette proposition ne renferme qu'un seul point qui semble appeler ou, pour mieux dire, admettre la discussion.

Il semble évident que le jour et la date universels doivent coïncider avec le jour et la date du méridien initial. La seule question qu'il nous reste donc à décider est de savoir quand on devra considérer comme commencé ce jour du méridien initial.

L'exacte réponse ne me semble aucunement douteuse.

A notre époque on compte généralement les dates par *jours* et non par *nuits*. On donne au mot "jour" deux significations différentes, il s'applique quelquefois à la partie du jour éclairée et quelquefois à la période de 24 heures, le jour et la nuit compris; mais n'importe dans laquelle de ces deux acceptations, le mot "jour" est employé; le mot midi n'a qu'une et même signification, à savoir: l'instant du jour où le soleil passe sur le méridien. Dans la question qui nous occupe, quand nous traitons de l'heure moyenne, midi signifie l'instant de midi moyen, soit le passage du soleil moyen par le méridien.

En conséquence, le jour civil, qui règle les affaires ordinaires de vie, commence et finit à minuit et se trouve à sa moitié à midi.

Il semble donc naturel que le jour universel suive cet exemple, qu'il commence et finisse à l'instant de minuit moyen sur le méridien initial, qu'il soit arrivé à la moitié de sa course à l'instant de midi moyen sur le même méridien.

Je ne puis donc voir la force du raisonnement qui a poussé la Conférence de Rome à recommander que le jour universel commencât à *midi* sur le méridien initial.

La seule base sur laquelle cette recommandation puisse être appuyée est que les astronomes, au lieu de se conformer à l'usage du jour civil, comme le reste du monde, ont l'habitude de se servir du prétendu jour astronomique qui commence à midi. L'avantage consiste en ce qu'ils écartent la nécessité de changer de date pendant la nuit, qui est le temps où ils sont le plus occupés; mais cet avantage est certainement bien mince si on le compare à l'inconvénient qui résulte d'avoir deux méthodes opposées de calculer les dates et à l'obligation de spécifier, quand il faut mentionner une date, quel système de calcul a été adopté. Si cette divergence est appelée à disparaître, il est évident que c'est aux astronomes à céder. Ils sont peu nombreux comparés au reste des humains.

Ils sont intelligents et pourraient, sans difficulté et au prix de peu ou

point d'inconvénients, opérer le changement nécessaire. Les changements dans les éphémérides astronomiques et maritimes seraient facilement exécutés. Comme ces éphémérides sont publiées nombre d'années à l'avance, les navigateurs auraient tout le temps de se familiariser avec le changement projeté dans la manière de calculer le temps, avant d'être appelés à s'en servir dans leurs opérations.

Je crois qu'ils en viendraient bientôt à penser qu'il est plus facile et plus naturel de calculer conformément au temps civil que d'accord avec le temps astronomique actuel. Je me suis laissé dire que ce système est déjà d'un usage général en ce qui concerne la tenue du journal de bord. Pour éviter toute cause d'erreur on indiquerait visiblement sur chaque page des éphémérides que partout le temps moyen a été calculé à partir de minuit.

Que les astronomes consentent ou non à adopter la méthode civile, je suis d'avis que nous devons adopter l'instant de minuit sur le méridien initial comme point de départ du jour universel.

Le rapport entre l'heure locale à n'importe quel endroit et l'heure universelle serait alors exprimé par cette simple formule:

Heure locale = heure universelle + longitude.

Tandis que si la proposition de la Conférence de Rome était adoptée, nous serions tenus d'employer la formule bien moins simple:

Heure locale = heure universelle + longitude — 12 heures.

En recommandant l'adoption du midi moyen à Greenwich comme point de départ du jour universel et des dates cosmopolites, la Conférence de Rome se rapporte à cet instant, attendu qu'il coïncide avec l'instant de minuit, ou avec le commencement du jour civil sous le méridien situé à 12 h. ou 180° de Greenwich. Or, ce renvoi au jour et à la date civils sur le méridien opposé à Greenwich semble non seulement inutile et quelque peu compliqué, mais il peut aussi engendrer l'ambiguïté dans les dates énoncées en jours universels, à moins que l'on n'évite cette ambiguïté en faisant une supposition arbitraire. Il est certain que le midi moyen de Greenwich, le 1er janvier correspond à minuit sur le méridien à 12 h. de Greenwich, mais à quel minuit? Comment sera-t-il désigné et quelle date correspondante sera donnée au jour universel? Appellerons-nous cet instant le commencement du jour universel marqué par le 1er ou le 2 janvier? Chacune de ces dates a des droits égaux à notre choix, le choix entre elles doit évidemment être arbitraire et peut, par conséquent, donner lieu à l'ambiguïté.

Si l'on adopte le minuit moyen de Greenwich comme point de départ du jour universel, désigné de conformité avec le jour civil correspondant de Greenwich, on évite tout malentendu et l'on n'a plus besoin de se référer au méridien opposé.

Telles sont les pensées que je désire exprimer relativement au point de départ du jour universel.

Je crois opportun de dire à ce sujet qu'il y a une semaine ou deux, le Professeur Valentiner ayant été invité d'assister aux séances de cette Conférence, afin que, s'il en était prié, il put émettre son avis à un point de vue scientifique sur les questions à l'étude; mais le Professeur Valentiner ayant été obligé de quitter Washington avant la fin de nos séances, j'ai jugé utile de lui demander son opinion par écrit sur le sujet dont la Conférence s'occupe en ce moment. Le professeur a écrit une lettre en allemand, et qui contient sa manière de voir. J'ai fait traduire cette lettre en anglais, et si la Conférence me le permet j'en donnerai lecture.

Aucune objection n'ayant été soulevée, le Professeur ADAMS continue: On sait que le Professeur Valentiner est un astronome éminent et ex-

périmenté, et je crois que son opinion sur un sujet qui intéresse fortement les astronomes sera considérée comme étant d'un grand poids. La lettre est ainsi conçue:

CHARLOTTEVILLE, VA.,
le 12 *octobre* 1884.

HONORÉ MONSIEUR: Vous avez bien voulu me demander quelle était ma manière du voir relativement au choix du moment pour le point de départ du jour. Ne pouvant m'arrêter plus longtemps à Washington, je prends la liberté de vous adresser ces quelques lignes.

Lorsque, comme dans le cas présent, il s'agit d'amener l'uniformité dans les calculs de l'heure astronomique et du monde civil, je crois qu'il appartient à l'astronome de céder. Pour toutes les fins de la vie civile on ne peut commencer la journée au milieu du jour, c'est-à-dire, au milieu de l'intervalle affecté au travail. En général il me semble natural que le milieu du jour, et non pas le commencement, soit marqué par la position la plus élevée du soleil, lequel préside à la vie civile. En effet, dans la vie civile il serait tout simplement impossible d'effectuer un changement de date au milieu du jour. Il est certain qu'il existe là une difficulté pour l'astronome; son activité se déploie principalement pendant la nuit, il est en conséquence tenu d'effectuer le changement de date au milieu de ses observations; cette difficulté est aggravée par ce fait qu'il relève presque exclusivement ses observations d'après l'heure sidérale, de sorte qu'un calcul deviens souvent nécessaire pour savoir si les observations ont été relevées après minuit ou au moment du changement de date. L'habitude peut néanmoins vaincre cette difficulté, et je pense qu'un doute pourra à peine se produire une fois qu'une formule uniforme sera adoptée dans le monde astronomique. En ce qui concerne les éphémérides nous établissons déjà de fait, le commencement des dates à l'heure de minuit, puisque la situation des planètes et des comètes est généralement déterminée sur le minuit de Berlin, de Greenwich ou autres localités. Mais depuis longtemps ces questions ont été discutées.

Il est à peine nécessaire que j'ajoute rien à ce que je viens de dire. Je n'hésiterais pas un instant à accorder une préférence au changement de date qui s'effectuerait à minuit, conformément au calcul civil, afin d'établir l'uniformité avec les habitudes de la vie civile.

Peut-être est-il important de faire observer que nous ne pourrions pas inaugurer ce changement sans délai, attendu que les éphémérides sont déjà calculées et publiées pour trois ou quatre années à l'avance. Il serait donc bon de fixer l'époque du changement normal des dates à un temps assez éloigné, à l'année 1890, par exemple.

J'ai l'honneur d'être votre très obéissant,

VALENTINER.

J'ajouterai que la méthode aujourd'hui la plus usuelle chez les astronomes, de relever le jour à partir de midi, n'est pas sans exceptions. Il existe de très importantes tables astronomiques qui comptent le jour à partir de minuit; telles sont les tables du soleil, de Delambre; les tables de la lune, de Burckhardt et Damoiseau; les tables de Jupiter, de Saturne et d'Uranus, de Bouvard; ainsi que les tables des satellites de Jupiter, de Damoiseau; ces tables prennent date à minuit moyen. Je mentionnerai aussi Laplace qui, dans sa mécanique céleste, adopte le minuit moyen de Paris comme le point de départ d'après lequel son jour est calculé. Il existe donc, même parmi les astronomes, de hautes autorités en faveur de minuit comme point de départ du jour.

M. le Général STRACHEY, délégué de la Grande-Bretagne. M. le Président, je remarque la présence parmi nous d'une éminente autorité américaine, je veux parler du Professeur Hilgard, invité à assister à la réunion de cette Conférence, et je serais d'avis qu'il fut prié d'exposer à la Conférence sa manière de voir dans la question dont nous occupons en ce moment.

M. le PRÉSIDENT. Avec l'assentiment de la Conférence nous serions heureux que le Professeur Hilgard voulut bien exposer sa manière de voir dans la question qui occupe en ce moment la Conférence.

La proposition du Président ne soulève aucune objection.

M. le Professeur HILGARD se lève et dit: Je vous remercie et je remercie la Conférence de cette invitation, je remercie également M.

le Général Strachey d'en avoir fait la proposition à la Conférence, mais mon opinion a été franchement énoncée en français et en anglais dans un rapport présenté à certain comité, établissant que je suis partisan du minuit de Greenwich comme point de départ du jour universel et du calcul de la longitude dans les deux directions à partir de Greenwich. Je ne puis réellement rien ajouter à ce qui a été dit dans l'argumentation déjà présentée par M. le Professeur Adams, et je ne crois pas devoir retenir un instant cette Conférence en répétant l'expression d'opinion qu'il a dévelopée en présence de personnes versées dans la matière.

Je vous prie de me dispenser de m'étendre davantage sur ma manière de voir. Je regrette que mon absence de cette ville m'ait empêché de profiter plus tôt de l'invitation qui m'a été faite.

Sir FREDERICK EVANS, délégué de la Grande-Bretagne. J'ai l'honneur de m'adresser de nouveau à la Conférence relativement au point de vue pratique du sujet dont nous nous occupons, en ce qui concerne la classe nombreuse des navigateurs. Je désire expliquer que, dans le discours que vient de prononcer mon collègue, le Professeur Adams, il me semble que deux sujets sont tant soit peu mélangés.

La question dont nous nous occupons exclusivement en ce moment est de savoir si le jour universel devra commencer à minuit ou à midi du méridien initial. C'est ce que nous sommes pratiquement appelés à décider. Or, je constate, d'après ce que le Professeur Adams vient de faire remarquer, que les éphémérides dont nous nous servons actuellement ont un rapport important avec cette question. Je ne crois pas que ceci doive avoir sur nous aucune influence, attendu que la prochaine résolution dont la Conférence sera saisie " exprime l'espoir qu'aussitôt qu'il sera possible de le faire les jours astronomiques et marins seront partout arrangés de façon à commencer à minuit."

Cette résolution, autant qu'il m'est donné de la comprendre, sera un avis aux astronomes pour qu'ils commencent à faire les changements qui découlent de cette résolution, en ce qui peut concerner les besoins des navigateurs. Je suis donc d'avis que nous devons procéder immédiatement au vote sur la question de savoir si le jour doit commencer à minuit ou à midi, sans faire mention des usages ou des intérêts de la navigation. Il ne me semble réellement pas qu'elle affecte le moins du monde ce sujet.

Je me suis attaché à considérer les conséquences pratiques de cette question—qu'il s'agisse de minuit ou de midi. Notre décision doit sanctionner la méthode qui offre le moins d'inconvénients au monde pris dans son ensemble. Je me suis assuré auprès de deux de mes collègues qui ont étudié cette question très à fond, que l'adoption de minuit occasionnera certainement moins de dérangement que midi, attendu que toutes les grandes colonies de l'univers s'en trouveraient moins affectées ; c'est-à-dire, que l'heure dont elles se servent maintenant serait moins affectée par l'adoption de minuit que par celle de midi. Cela étant, il me semble essentiel d'en arriver à trancher cette question.

M. RUIZ DEL ARBOL, délégué d'Espagne. Je dirai seulement que j'ai écouté les observations faites relativement au changement de l'heure employée par les navigateurs. J'ignore si beaucoup de navigateurs sont ici présents, mais il est de fait que les marins calculent le jour à partir de midi.

Le PRÉSIDENT. Je prie le délégué d'Espagne de m'excuser, mais dans la marine des États-Unis nous calculons le jour à partir de minuit.

M. RUIZ DEL ARBOL, délégué d'Espagne. Je parle en général. Or, cette règle parmi les marins s'appuie sur certaine raison, c'est que la seule manière de déterminer la position du navire est d'observer la hau-

teur méridienne du soleil, et chacun, dans une traversée, éprouve le besoin de savoir ce qui s'est passé chaque jour pendant sa durée, depuis le commencement jusqu'au dernier instant du jour; et je pense que quelle que soit la règle dans la marine des États-Unis, les navigateurs calculeront généralement l'heure comme ils la calculent maintenant.

Je crois que les navigateurs ne changeront pas la règle aujourd'hui en usage, en dépit de ce que nous pourrons adopter dans cette Conférence.

Le Commandant SAMPSON, délégué des États-Unis. Je crois, M. le Président et Messieurs, que le changement qui consisterait à adopter le jour universel commençant à minuit serait très positivement avantageux aux navigateurs. Les chiffres donnés aujourd'hui pour les éphémérides maritimes partent de midi du méridien qui leur sert de base pour les calculs, tels que Washington, Greenwich, etc. Il est évident que le but que se propose tout navigateur, en se servant des éphémérides, est de déterminer sa différence d'heure avec Greenwich. En conséquence, si nous supposons que les navigateurs sont à peu près également répartis, une moitié sur un hémisphère du globe, et l'autre moitié sur l'autre hémisphère, le jour de Greenwich serait pour une partie la nuit locale pour l'autre.

Les observations habituelles faites par les navigateurs à la mer consistent à relever la hauteur méridienne du soleil pour la latitude, outre une observation faite le matin, et peut-être aussi le soir, pour relever la position du soleil sur le premier vertical pour la longitude. Par suite, tous les navigateurs, se trouvant à proximité du méridien initial, auraient à faire leurs observations d'un même jour à deux dates différentes. D'autre part, les navigateurs qui se trouvent dans le voisinage du 180° méridien auront leurs observations faites dans un jour coïncidant avec le même jour astronomique. Les premiers auraient l'avantage d'interpoler relativement à de courts intervalles seulement, tandis que les seconds seraient obligés d'interpoler pour des intervalles beaucoup plus considérables.

Il en résulte, en somme, qu'il serait indifférent aux navigateurs que les chiffres donnés par les almanachs nautiques indiquent midi ou minuit du méridien initial. Une autre considération, cependant, rendrait très avantageux que les chiffres fussent donnés pour minuit. Voici quelle est cette considération: Si l'on choisissait minuit, le jour universel serait alors identique au jour de l'almanach nautique et les navigateurs n'auraient plus à s'occuper que de l'heure du board et de l'heure universelle, tandis que si les chiffres étaient donnés pour midi, ils auraient à ajouter l'heure astronomique aux deux autres. Je regarde cette considération comme très importante.

Le PRÉSIDENT. La question porte sur l'amendement présenté par le délégué de Suède, M. le Comte Lewenhaupt, et dont il a été donné lecture.

L'amendement étant mis aux voix, le résultat est le suivant:

Votent affirmativement: Autriche, Italie, Pays-Bas, Suède, Suisse, Turquie.

Négativement: Brésil, Chili, Colombie, Costa-Rica, États-Unis, Grande-Bretagne, Guatémala, Japon, Hawaïi, Libérie, Mexique, Paraguay, Russie, Vénézuéla.

S'abstiennent de voter: Allemagne, Espagne, France, Saint-Domingue.

Oui, 6; non, 14; abstentions, 4.

En conséquence l'amendement est rejeté.

La question revient alors sur la proposition originale présentée par le délégué des États-Unis.

RUSTEM-EFFENDI, délégué de Turquie. M. le Président, j'ai suivi avec le plus vif intérêt et avec toute l'attention possible les savantes dissertations auxquelles a donné lieu au sein de la Conférence la proposition de M. Rutherfurd, délégué des États-Unis, pour l'adoption d'une heure universelle.

Cette question grave et importante intéresse à un certain degré tous les peuples du globe. Aussi, je crois de mon devoir d'en dire quelques mots, car je tiens à bien définir la position que mon Gouvernement veut assumer dans ce débat.

Je n'ai certes pas la prétention d'aborder le côté scientifique de la question. Des voix bien plus autorisées que la mienne ont presque épuisé ce sujet. Ma tâche est bien plus modeste. Je me bornerai à examiner les conditions que doit réunir notre proposition pour qu'elle ait la chance d'être adoptée par nos Gouvernements respectifs.

La question, Messieurs, de l'heure universelle n'intéresse pas tous les peuples également. Les États-Unis d'Amérique, bien que comparativement une jeune nation, ont fait de tels progrès dans le domaine de la science et des recherches scientifiques qu'ils ne peuvent qu'être très intéressés dans cette question. L'immense étendue de leur territoire qui embrasse plus de soixante degrés de longitude, avec une différence de temps de plus de quatre heures, les oblige presque à adopter l'heure universelle. L'immense réseau de chemins de fer qui sillonne entout sens leur vaste domaine et met en communication des points si éloignés les uns des autres, nécessite l'adoption d'un système horaire uniforme afin d'éviter la confusion amenée par la variation des heures locales. Il était, par conséquent, tout naturel que l'idée de l'heure universelle ait eu son origine ici et au Canada. D'autres pays existent également, tels que l'Empire Britannique, la Russie et l'Allemagne, où l'adoption d'un tel système serait utile. Mais il y a aussi des contrées peu étendues en longitude, telles que la France, l'Espagne, la Suède et la Norvège, etc., etc., qui peuvent se suffire à elles-mêmes avec leur heure nationale, vu que l'heure locale ne varie pas sensiblement. Pour ces pays l'adoption du jour universel ne serait que d'une importance secondaire, car elle ne pourrait affecter que leurs relations internationales. Qu'il me soit permis de vous rappeler à ce sujet, Messieurs, les conclusions émises par une commission composée de savants, de fonctionnaires supérieurs, des postes et télégraphes, d'administrateurs de chemins de fer, etc., nommée par le Gouvernement Français pour étudier cette question. Si ma mémoire ne me fait pas défaut, ils se sont prononcés en faveur de l'adoption de l'heure universelle, mais ils ont aussi ajouté que les avantages à retirer pour leurs pays de cette mesure n'était que d'une importance secondaire. Le savant délégué de France, M. Janssen, voudra bien peut-être nous donner quelques détails à ce sujet.

Il résulte des quelques remarques que je viens de faire, que les promoteurs de l'heure universelle, et ceux qui y sont directement intéressés, doivent apporter quelque tempérament dans l'application de cette réforme aux autres États. En d'autres termes, modifier leur proposition de façon à laisser à chaque pays la plus grande latitude possible pour l'adoption du jour universel.

En ce qui regarde l'Empire Ottoman, je dois dire qu'il se trouve dans une position quelque peu exceptionnelle relativement à l'application de cette mesure, et qu'il se trouve, par conséquent, dans la nécessité de demander encore plus de latitude que les autres pays intéressés.

Nous avons, en effet, chez nous deux manières de compter les divisions du jour naturel. L'une consiste à compter de midi, à midi ou de minuit à minuit, ainsi que l'on fait partout. Nous appelons cette heure, heure

à la franque. L'autre manière consiste à compter du coucher du soleil au coucher suivant. Les heures commencent, dans ce système, à partir du moment où le centre du soleil vrai se trouve sur la partie occidentale du cercle qui est l'intersection imaginaire de l'horizon avec la sphère céleste, et elles se comptent de 0 à 12 deux fois, au lieu de 0 à 24 sans interruption.

Nous reconnaissons les inconvénients de cette façon de compter les heures du jour, c'est-à-dire, de prendre l'horizon comme premier cercle horaire. Ainsi dans ce système, le moment où l'heure est zéro varie chaque jour. En d'autres termes l'intervalle du temps d'un coucher du soleil au coucher suivant n'est pas tout à fait de 24 heures. Suivant la saison, le moment du coucher du soleil avance ou retarde; à Constantinople, la meilleure montre du monde, par conséquent, avancera ou retardera de 3 minutes à peu près au maximum.

Malgré ces inconvénients assez sérieux, des considérations religieuses, aussi bien que nationales, nous empêchent d'abandonner ce système horaire. Les heures des différentes prières musulmanes se comptent d'un coucher du soleil au coucher suivant. Notre population, qui est en majorité agricole, désire naturellement savoir, pendant son travail, les heures qui restent jusqu'au coucher du soleil. Il lui serait, par conséquent, très difficile, sinon presque impossible, de changer sa façon de compter les heures. Nos marins, pourtant, emploient généralement l'heure à la franque.

Pour me résumer, Messieurs, je tiens à déclarer que je suis tout prêt à voter en faveur de l'adoption de l'heure universelle, mais avec la réserve expresse que l'usage de cette heure sera limitée aux transactions internationales, sans toucher en quoi que ce soit à l'heure nationale. Avant de reprendre mon siège, je tiens à remercier M. le Président et les membres de la Conférence de la bienveillante attention qu'ils ont bien voulu prêter à mes remarques.

M. le PRÉSIDENT. Nous rappelerons au délégué de Turquie que la résolution suivante a été adoptée lors de notre dernière séance:

> La Conférence propose l'adoption d'une heure universelle pour tous les besoins pour lesquels elle peut être trouvé convenable, cette heure ne devra pas empêcher l'usage de l'heure locale ou d'une autre heure normale, qui paraîtrait désirable.
>
> La difficulté même, pressentie par le délégué de Turquie, a donc été soigneusement prévue dans la résolution dont on vient de donner lecture.

M. SANDFORD FLEMING, délégué de la Grande-Bretagne. Suivant moi, il est très important que cette proposition soit adoptée. J'ai déjà amplement exposé mes idées sur cette question, et par conséquent je prie la Conférence de me permettre de dire quelques mots, sans toutefois avoir l'intention d'abuser de son attention. Il est évident d'après ce que j'ai osé avancer, que je trouve que nos usages par rapport au calcul du temps sont arbitraires. Sur un point il ne peut y avoir aucun doute. Il n'y a, et il ne peut y avoir, qu'une seule manière de compter le temps, quoique les usages dont nous avons hérités nous aient donné un nombre considérable et confus de manières de compter. Il ne peut y avoir aucun doute sur un autre sujet, que le progrès de la civilisation demande un système plus simple et plus rationnel. Nous sommes arrivés à ce moment où l'unification du nombre infini de calcul des temps est nécessaire.

Cette unification sera accomplie à un haut degré si cette résolution est adoptée, et par son adoption, il me semble que la Conférence aura créé des bienfaits durables dans le monde.

L'heure universelle n'interférera aucunement avec l'heure locale. En tout lieu on pourra continuer à se servir du vieux système, ou bien on

pourra accepter un changement quelconque, qu'une condition particulière pourrait nécessiter.

Mais l'adoption de l'heure universelle n'implique aucun changement; ce sera plutôt quelque chose d'ajouté à ce que l'on possède maintenant, ce serait un bienfait pour ceux qui en feront usage.

A l'est du premier méridien toute heure locale possible sera en avance, à l'ouest sera en retard sur l'heure universelle.

L'heure universelle, comme elle est définie dans la proposition, sera la moyenne de toutes les heures locales possibles et l'unité à laquelle elles peuvent toutes être rapportées par un certain intervalle connu, cet intervalle étant exprimé par la longitude.

A mon avis, cette résolution est des plus appropriées et la Conférence agirait sagement en l'adoptant.

M. le PRÉSIDENT. On va procéder au vote.

Les États ci-après nommés votent pour l'affirmative: Brésil, Chili, Colombie, Costa-Rica, États-Unis, Grande-Bretagne, Guatémala, Hawaiï, Japon, Libérie, Mexique, Paraguay, Pays-Bas, Turquie, Vénézuéla.

Votent pour la négative: Autriche-Hongrie, Espagne.

S'abstiennent de voter: Allemagne, France, Italie, Pays-Bas, Saint-Domingue, Suède, Suisse.

Oui, 15; non, 2; abstentions, 7.

M. le PRÉSIDENT annonce alors que la proposition est adoptée.

Mr. RUTHERFURD, délégué des États-Unis. M. le Président, j'ai l'honneur de soumettre à la considération de la Conférence la proposition suivante:

La Conférence exprime l'espoir qu'aussitôt qu'il sera possible de le faire, les jours astronomiques et les jours marins soient partout réglés de façon à commencer à minuit.

Avant qu'il soit passé outre au sujet de cette proposition, je prendrai la liberté de faire une correction verbale. Il me semble que le mot "moyen" devrait être introduit et placé avant le mot "minuit"; je modifie donc ma résolution en ce sens.

On procède au vote sur cette proposition qui est acceptée à l'unanimité.

M. le PRÉSIDENT. Nous avons l'honneur d'annoncer que les protocoles en français et en anglais, relatifs aux première et deuxième séances de cette Conférence, ont été examinés et se trouvent actuellement soumis à la Conférence pour être approuvés. Si quelqu'un des délégués désire faire quelques observations sur ces protocoles, il peut les présenter, et si elles sont approuvées par l'assemblée on en tiendra compte.

Aucune objection n'étant soulevée, le Président propose à la Conférence l'adoption de ces mêmes protocoles qui sont adoptés à l'unanimité.

M. JANSSEN, délégué de France. M. le Président, nous avons été chargés de présenter à l'approbation du Congrès le vœu que les études relatives à l'application du système décimal, à la mesure des angles et à celle du temps, soient reprises de manière que cette application puisse être étendue à tous les cas, et ils sont nombreux et importants, où elle présente des avantages réels.

Je dirai qu'un vœu analogue sur le même sujet a été omis par la Conférence de Rome.

Vous savez, Messieurs, qu'au moment de l'institution du système métrique, on avait étendu la division décimale à la mesure des angles et à celle du temps. De nombreux instruments furent même construits d'après le nouveau système. Pour ce qui concerne le temps, la réforme introduite trop brusquement, et on peut le dire, sans qu'on y mit assez

de discernement, se heurta à des habitudes trop anciennes et fut rapidement abandonnée; mais à l'égard de la mesure des angles, où la division décimale présente tant d'advantages, la réforme se maintint beaucoup mieux, et s'est conservée pour certains usages jusqu'à aujourd'hui. Ainsi la division de la circonférence en 400 grades fut adoptée dès l'origine par Laplace, et on la trouve couramment employée dans la mécanique céleste. Delambre et Méchain se servirent, pour la mesure de l'arc du méridien, d'où découla le mètre, de cercles répétiteurs divisés en grades. Enfin, de nos jours, le Colonel Perrier, chef du service géographique à notre ministère de la guerre, se sert d'instruments à division décimale, et fait calculer en ce moment même des tables logarithmiques appropriées à ce mode de division.

Mais c'est surtout quand il s'agit d'exécuter de longs calculs sur les mesures angulaires que la division décimale présente d'immenses avantages. A cet égard, on ne rencontre plus, pour ainsi dire, que l'unanimité parmi les savants.

La Conférence de Rome qui réunissait précisément tant d'astronomes, de géodésiens, de topographes éminents, c'est-à-dire, les hommes les plus compétents et les plus intéressés dans la question, a émis à cet égard un vœu dont il est impossible de méconnaître la haute autorité.

Il est donc aujourd'hui évident que le système décimal qui a déjà rendu tant de services pour les mesures de longueur, de volumes, de poids, est appélé à rendre des services analogues dans le domaine des grandeurs angulaires et de durée.

Je sais que cette question de la division décimale rencontre, principalement en ce qui concerne la mesure de temps, de légitimes appréhensions. On craint qu'on ne veuille violenter des habitudes séculaires et bouleverser des usages consacrés.

A cet égard, Messieurs, je crois que nous devons être pleinement rasurés. Les enseignements du passé seront mis à profit. On comprendra que c'est pour avoir voulu une réforme qui ne se renfermait pas assez dans le domaine scientifique, mais qui violentait les habitudes de la vie journalière qu'on a échoué à l'époque de la révolution. Il faut reprendre la question, mais il faut la reprendre avec le sentiment des limites que le bon sens et l'expérience indiqueront toujours à des hommes sages et expérimentés.

Je crois que le caractère de la réforme serait bien défini en disant qu'il s'agit surtout de faire un nouvel effort vers l'application du système décimal dans l'ordre scientifique.

Mais, Messieurs, je n'ai pas à discuter ici la portée des réformes que l'étude de cette question pourra conduire à proposer. Il me suffit de montrer qu'il y a dans cette direction un pas indispensable à faire, et de vous demander d'émettre le vœu que la question soit mise à l'étude. Je ne crois pas qu'il y ait personne ici qui voudrait s'opposer à une demande qui n'engage aucune solution et qui paraît aujourd'hui si opportune.

Je prierai donc M. le Président, de vouloir bien soumettre la proposition suivante à la Conférence:

La Conférence émet le vœu que les études destinées à régler et à étendre l'application du système décimal à la division des angles et du temps soient reprises, de manière à permettre l'extension de cette application pour les cas où elle présente des avantages réels.

M. le PRÉSIDENT. Le Président est d'opinion que la Conférence n'a été convoquée qu'en vue d'un objet spécial et limité, et que la considération du système décimal, proposée par M. le délégué de France, lui est tout à fait étrangère, et est même en dehors du but de la Conférence.

Le Président toutefois n'agit qu'au nom de la Conférence, et si celle-ci décide qu'il faut prendre la proposition en considération il s'y rendra ; mais il lui paraît que cette manière de procéder n'est pas régulière.

M. le Général STRACHEY, délégué de la Grande-Bretagne. Monsieur le Président, je voudrais exprimer mes vues personnelles sur ce sujet. Je serais très désireux de me joindre à M. le délégué de France en votant une telle proposition, mais je crains qu'il n'y ait l'impression chez beaucoup de délégués qu'il n'est point de notre compétence de la discuter. S'il en est ainsi, je ferais observer s'il ne serait pas mieux de ne pas émettre de vote. Il serait fâcheux de voir dans les comptes-rendus des délibérations de cette Conférence rien qui fût contraire au sujet de cette proposition. Je pense donc que si Messieurs les délégués se sont formés une opinion décisive sur la question, ils pourraient l'exprimer sans voter ; et je répète qu'il serait bien regrettable de voir repousser le système décimal pour diviser le cercle et le temps, surtout après qu'il a été adopté à l'unanimité par la Conférence de Rome.

M. le Professeur ADAMS, délégué de la Grande-Bretagne. M. le Président, je dois avouer que quoique je sois complètement d'accord avec M. le Général Strachey, et que je ne veuille pas voter contre la proposition présentée par notre éminent collègue, M. Janssen, je la crois en dehors de la compétence de la Conférence, et que, conséquemment, je m'abstiendrai de voter. Je reconnais pleinement que, pour certains besoins, la division décimale du cercle est très précieuse.

M. le PRÉSIDENT. A moins que la Conférence ne décide qu'on doit s'occuper de la proposition, le Président propose de ne pas ouvrir la discussion. Si un membre désire remettre le sujet en question, il peut en appeler de ma décision.

Le Général STRACHEY, délégué de la Grande-Bretagne. Dois-je comprendre par là, Monsieur le Président, que la discussion est close?

M. le PRÉSIDENT. Le Président a décidé que la proposition faite par le délégué de France ne doit par être présentée, et à moins que la Conférence exprime une opinion différente, la question est vidée. Le Président désire cependant montrer à M. le délégué de France la plus grande déférence ; car tous, nous sommes heureux de lui faire honneur en toutes choses.

M. le délégué de France veut-il appeler de la décision du Président et désire-t-il avoir l'opinion de la Conférence ?

M. JANSSEN. Oui, M. le Président.

M. le Commodore FRANKLIN, délégué de la Colombie. Monsieur le Président, je voudrais entendre relire la résolution. Si c'est simplement une suggestion pour considérer la question du système décimal, je voudrais le savoir.

La proposition est relue.

L'appel de la décision du Président fut alors mis aux voix.

Votent en faveur de la prise en considération : Autriche-Hongrie, Brésil, Chili, Espagne, France, Italie, Japon, Mexique, Pays-Bas, Saint-Domingue, Suisse, Turquie, Vénézuéla.

Votent contre : Allemagne, Colombie, Costa-Rica, États-Unis, Grande-Bretagne, Guatémala, Hawaïï, Libérie, Paraguay.

S'abstiennent de voter : Russie, Suède.

Pour, 13 ; contre, 9 ; abstentions, 2.

M. le PRÉSIDENT. L'appel de la décision du Président est maintenu, et la proposition de M. le délégué de France est soumise à votre délibération. Si personne ne demande la parole, on va procéder au vote.

M. JANSSEN, délégué de France. M. le Président, avant le vote définitif, je désirerais faire remarquer encore une fois à nos collègues

qu'il s'agit ici d'une extension tout à fait urgente du système décimal, extension réclamée aujourd'hui par un grand nombre de nos plus hautes autorités scientifiques et de nos observateurs les plus distingués. Comme je le disais, il n'y a qu'un instant, l'assemblée de Rome, à laquelle vous reconnaissez avec raison une haute autorité à l'égard des matières qui viennent de vous occuper, cette assemblée, dis-je, en avait certes une plus haute encore à l'égard de l'astronomie, de la géodésie, de la topographie, c'est-à-dire, dans le domaine qui est visé par notre proposition. Or, à Rome on a émis un vœu tout à fait analogue à celui que nous vous demandons de formuler.

Si nous remarquons en outre qu'il ne s'agit ici que d'exprimer le désir que des études soient reprises sur le sujet en question, je me demande si quelqu'un d'entre nous voudrait s'opposer à une proposition libérale qui ne préjuge rien dans les solutions à intervenir, mais qui conduira certainement à d'importants progrès.

Je ne doute donc pas que nos collègues voudront tous s'associer à une proposition qui, par son objet et par la manière dont elle est formulée, me paraît devoir rallier tous les suffrages.

Aucune observation n'ayant été faite sur la proposition, M. le Président la met aux voix:

Votent en faveur de la proposition: Autriche-Hongrie, Brésil, Colombie, Costa-Rica, Chili, France, Grande-Bretagne, Hawaïi, Italie, Japon, Libérie, Mexique, Pays-Bas, Paraguay, Russie, Saint-Domingue, Espagne, Suisse, Turquie, Vénézuéla, États-Unis.

Votent contre: Néant.

S'abstiennent de voter: Allemagne, Guatémala, Suède.

Pour l'adoption de la proposition, 21; contre, 0; abstentions, 3.

M. le PRÉSIDENT. La proposition de M. le délégué de France est en conséquent adoptée.

M. le Général STRACHEY, délégué de la Grande-Bretagne. Monsieur le Président, avant de clore la séance d'aujourd'hui, j'espère que MM. les délégués seront en position de prendre connaissance des deux propositions, que je désirerais maintenant soumettre, et qui, j'ose croire, tenderont à éclaircir de beaucoup la discussion que nous avons eue. La première de ces propositions est ainsi conçue:

La Conférence adopte l'opinion que, pour les besoins de la vie civile, il sera convenable de déterminer l'heure, en accord avec l'heure civile locale de méridiens successifs distribués autour de la terre, à des intervalles ou de dix minutes, ou d'un multiple intégral quelconque de dix minutes, à partir du premier méridien, mais que quant à l'application de ce principe on s'en remettra aux différentes nations ou administrations intéressés.

Cette proposition ainsi conçue embrasse toutes les suggestions pratiques qui ont été faites à ce sujet jusqu'ici. La seule restriction qu'elle propose de faire sur ce que l'on peut appeler le temps normal est que le point d'interruption se trouvera à des intervalles définis de dix minutes ou plus.

La seconde proposition que je présente est des plus simples, la voici:

La disposition à prendre pour l'adoption d'une heure universelle dans la télégraphie internationale serait confiée à la considération du Congrès international de télégraphie.

Il a été institué par une entende internationale un congrès qui se réunit tous les deux ans afin d'étudier les questions de télégraphie internationale, et je crois que la manière précise avec laquelle l'heure universelle pourrait être adoptée à la télégraphie, est plutôt l'objet de ce congrès.

M. DE STRUVE, délégué de Russie. Qu'il me soit permis de faire au nom des délégués de la Russie les quelques remarques suivantes:

Nous avions déjà énoncé l'idée que l'heure universelle devrait être adoptée pour les communications directes internationales par chemin de fer, poste et télégraphe. Mais il s'entend de soi-même que l'heure locale ou tout autre temps normal qui serait étroitement lié avec l'existence quotidienne doit forcément être employé conjointement avec l'heure universelle.

Il a été proposé, dans le but d'établir un rapport plus facile entre l'heure locale et l'heure universelle, de diviser la circonférence de la terre par 24 méridiens, à égales distances de 1 heure, soit de 15°, ou par 144 méridiens placés à 10 minutes d'intervalle soit de $2\frac{1}{2}$° de distance.

Cette question n'ayant pas encore été suffisamment étudiée dans ses détails par les gouvernements respectifs, et n'ayant pas été discutée à la Conférence internationale de Rome, nous croyons qu'il sera difficile, sinon prématuré, de se prononcer sur l'opportunité pour l'Europe de telle ou telle autre division du globe terrestre en zones de temps égales.

Nous nous permettons de suggérer que conjointement avec l'usage depuis longtemps établi de compter les heures en deux périodes de 12 heures chacune de 0 à 12 on introduise pour le temps local le nouveau système projeté pour le temps universel de compter les heures de 0 à 24 heures.

M. le Comte DE LEWENHAUPT, délégué de Suède. J'ai eu l'honneur de transmettre aux membres de la Conférence un résumé d'un rapport sur ce sujet fait par le Professeur Gyldén, un éminent astronome suédois, dont le nom sans doute est connu par un grand nombre des délégués. Le système proposé par M. Gyldén est du même genre que celui proposé par le délégué de la Grande-Bretagne. La seule différence est que M. Gyldén, en expliquant le système, recommande l'adoption de méridens équidistants séparés par intervalles de 2° et demi ou 10 minutes de temps, tandis que la proposition du délégué de la Grande-Bretagne est rédigée de manière que l'intervalle des méridiens puisse être supérieur à 10 minutes. Cette différence, d'ailleurs, n'est qu'une question de détail. La base du système de M. Gyldén est, que les méridiens horaires devront être séparés du méridien initial normal, soit par 10, soit par un multiple de 10 minutes. En conséquence, je voterai avec plaisir pour la proposition du délégué de la Grande-Bretagne.

Je demande seulement la permission à la Conférence de faire insérer le rapport de M. Gyldén à la suite de ces observations.

Résumé d'un rapport lu à la Société de géographie en Suède par Hugo Gyldén, professeur d'astronomie et membre de l'Académie des sciences à Stockholm, sur l'emploi de méridiens équidistants pour la fixation de l'heure.

Si l'on se figure le méridien passant par l'observatoire de Greenwich prolongé sur la sphère terrestre entière, ce grand cercle coupera, à 180° de Greenwich, l'équateur à un endroit situé un peu à l'est de la Nouvelle-Zélande. Le méridien, dont il s'agit, tombe presque entièrement dans l'océan et coupe tout au plus quelques petites îles du Pacifique. Si nous supposons ensuite un autre grand cercle à 90° du méridien de Greenwich, sa moitié occidentale touchera presque la Nouvelle-Orléans, et sa moitié orientale passera à quelques minutes de Calcutta. Si l'on fixe l'heure d'après ces quatre méridiens, on aura quatre temps cardinaux, un européen, un américain, un asiatique, et un océanien.

Il sera, cependant, nécessaire de fixer beaucoup plus d'un seul temps civil pour l'Europe. Je me figure donc l'Europe couverte de tout un système de méridiens, qui ne devront être pas plus rapprochés l'un de l'autre que de 2° et demi; la différence de temps entre ces méridiens ne sera alors que de 10 minutes, une différence entre le temps civil et le vrai temps solaire qui peut, en général, être considérée comme insignifiante. Le point de départ de ce système est le méridien de Greenwich. A l'ouest, le système devra s'étendre à 30 minutes; à l'est à 2 heures et demie ou jusqu'à un méridien passant près de Moscou.

Je suppose comme 0 le méridien passant par Greenwich. Le méridien le plus proche à l'est sera le méridien 1. Ce dernier ne passera pas bien loin de l'observatoire de Paris, car la différence entre ce méridien et celui de Paris ne comporte que 40 secondes, différence insignifiante dans la vie civile. Nous pourrons nommer le méridien 1 méridien de Paris ou méridien français.

Le second méridien (à l'est de Greenwich) ne touche pas Utrecht, mais il passe cependant si près que le temps de cette ville pourrait être déterminé, sans le moindre inconvénient, comme si la différence de temps entre Greenwich et Utrecht comportait exactement 20 minutes. Le second méridien passerait également presque tout aussi près d'Amsterdam (22 secondes), et ne serait non plus loin de Marseilles (1 m. 29 s.). Au voisinage du troisième méridien nous rencontrons d'abord Berne (16 s.), puis, un peu plus à côté, Turin (42 s.). Le quatrième méridien sera près des villes de Hambourg, Altona, et Gottingue (respectivement 6 et 14 s.); non loin du même méridien se trouve Christiania, quoique à une distance d'un peu plus de 2 minutes. Le cinquième méridien passera aussi très près de trois grandes villes, à savoir: Rome (5 s.), Leipsic (26 s.), et Copenhague (20 s.). Le sixième méridien ne touche aucune ville considérable, mais il coïncide au plus près avec le méridien adopté pour le temps civil de la Suède; la différence n'est que de 15 secondes.

La petite ville de Brieg, au voisinage de Breslau, est touchée par le septième méridien, et Kœnigsberg se trouve à 2 minutes du huitième. Le neuvième méridien passe moins d'une minute à l'ouest d'Abo et n'est distant que de quelques secondes de la ville de Mistra, en Grèce. Le dixième touche presque Helsingfors, en Finlande. Au voisinage du onzième méridien, je n'ai pu trouver de localité importante, située exactement de manière à mériter une place dans cette liste, mais je peux, cependant, mentionner les villes de Minsk et Jassy. Le douzième méridien est situé à 1 m. 14 s. à l'ouest du palais de l'Académie des sciences de St.-Pétersbourg, et sa situation est à peu près la même par rapport à Kiew. Il n'est pas nécessaire de continuer l'énumération des autres méridiens à l'est, par intervalles de 10 minutes; je dirai seulement que Moscou étant situé à 2 h. 30 m. 17 s. à l'est de Greenwich, le système conviendrait pour cette ville.

Si nous passons à l'ouest de Greenwich, nous trouverons que le méridien 1 ouest passera très près de la petite ville d'Almeria au midi de l'Espagne; ce dernier pays s'étend à une distance égale des deux côtés de ce méridien, à l'est et à l'ouest, et la situation du Portugal est la même par rapport au troisième méridien ouest.

En conséquence, dans toutes ces villes et localités énumérées ci-dessus, et dont la plupart sont d'une certaine importance, le temps local coïncide si près avec des temps dont la différence de l'heure de Greenwich peut être exprimée par des multiples entiers de 10 minutes qu'il n'y a pas lieu d'appréhender d'inconvénients réels, si ces temps étaient adoptés pour déterminer l'heure locale. Dans le cas où les différents pays en Europe décidaient de se rattacher au système qui vient d'être développé, le système suivant de temps normaux serait peut-être à recommander:

A l'est de Greenwich:

1er méridien: La France.
2me méridien: La Hollande et la Belgique.
3me méridien: La Suisse.
4me méridien: La Norvége (et l'Allemagne occidentale?).
5me méridien: Le Danemark, l'Allemagne et l'Italie.
6me méridien: La Suède et l'Autriche.
7me méridien: L'Allemagne orientale.
8me méridien: La Hongrie.
9me méridien: La Pologne et la Grèce.
10me méridien: La Finlande, la Roumanie et la Bulgarie.
11me méridien: La Turquie d'Europe.
12me méridien: La Russie occidentale.

A l'ouest de Greenwich:

1er méridien: L'Espagne.
3me méridien: Le Portugal.

Il n'est cependant rien moins que nécessaire que chaque pays adopte un temps civil unique pour la totalité de son territoire. Même avec plusieurs temps, on pourrait parfaitement se rattacher au système, si seulement les temps choisis se séparent par 10 minutes, 20 minutes est de celui de Greenwich, mais il serait nécessaire que les différentes horloges indiquassent les temps avec une grande précision, et que l'écart ne fût pas même de quelques secondes, car, en tout autre cas, les avantages de l'adoption du système seraient sensiblement diminués. Cette circonstance que chaque pays, tout en se rattachant complètement au système, aurait une certaine indépendance pour le choix du temps civil le plus opportun, est d'une importance assez considérable pour ce qui regarde la possibilité de réaliser un système de ce genre. On peut, en effet, procéder à l'application du nouveau système de telle manière que la transition sera à

peine sensible pour la grande majorité de la population. Les avantages seraient les mêmes pour les chemins de fer et les télégraphes, que si les temps locaux étaient partout identiques, vu qu'il est facile de se rappeler le multiple de 10 minutes, qu'il faut ajouter à l'heure d'un pays pour la réduire à celle d'un autre pays. La différence de temps entre la Suède et le Danemark serait par exemple de 10 minutes, circonstance qui se graverait bientôt dans la mémoire de chacun. Un voyageur quittant la Suède saurait alors que sa montre, si elle est bien réglée, indique exactement 10 minutes de plus que les horloges des chemins de fer danois, et s'il continuait son voyage jusqu'à Paris, il se rappellerait que les horloges de cette ville sont 50 minutes en retard sur celles de la Suède.

J'ai essayé d'exposer les avantages de ce système pour les pays de l'Europe. Je ne suis pas à même de juger si des systèmes analogues pourraient être considérés nécessaires en Amérique et en Asie. Il est possible que l'Amérique du Nord pût se contenter d'un seul temps normal, lequel, dans le cas où l'Amérique se rattacherait au système européen, devrait être fixé exactement 6 heures après le temps de Greenwich. En partant de ce méridien normal, il est possible d'établir un système plus ou moins développé de temps équidistants, analogues à celui qui a été proposé pour l'Europe. Cela peut être dit aussi par rapport aux temps civils de l'Asie qui devront se rattacher à un temps normal devançant de 6 heures celui de Greenwich.

L'Afrique devra nécessairement faire partie du système européen; on pourrait choisir pour Alger et Tunis le temps civil français; pour Tripoli, le temps civil de Danemark, Allemagne et Italie; pour l'Égypte, le temps russe; pour le Maroc, le temps espagnol; à l'embouchure du Congo où, sans doute, il se formera, tôt ou tard, un centre important de civilisation, le méridien de la Suède et de l'Autriche pourrait être employé; enfin, le méridien hongrois pourrait servir pour le territoire du Cap de Bonne Espérance.

Il n'est pas possible de rattacher l'Amérique du Sud et l'Australie à l'un des quatre temps cardinaux mentionnés, mais on peut trouver sans difficulté d'autres combinaisons qu'il n'est pas nécessaire d'examiner en ce moment.

M. le PRÉSIDENT. Si aucune opposition n'est présentée, la brochure dont a parlé M. le délégué de Suède sera imprimée suivant la demande qu'il vient de faire.

M. LEFAIVRE, délégué de France. M. le Président, je propose d'ajourner la Conférence à mercredi, à une heure de l'après-midi.

La motion est adoptée, et en conséquence à 4 heures et demie la Conférence s'ajourne jusqu'à mercredi, 22 courant, à une heure de l'après-midi.

PROTOCOLE VII.

SÉANCE DU 22 OCTOBRE 1884.

La Conférence se réunit dans le Salon Diplomatique du Département d'État, à 1 heure de l'après-midi.

Sont présents:

Allemagne: M. le Baron von Alvensleben et M. Hinckeldeyn.
Autriche-Hongrie: M. le Baron Ignatz von Shæffer.
Brésil: M. le Dr. Luiz Cruls.
Chili: M. F. V. Gorman et M. A. B. Tupper.
Colombie: M. le Commodore S. R. Franklin.
Costa-Rica: M. Juan Francisco Echeverria.
Espagne: M. Juan Valera, M. Emilio Ruiz del Arbol et M. Juan Pastorin.
États-Unis: M. le Contre-Amiral C. R. P. Rodgers, M. Lewis M. Rutherfurd, M. W. F. Allen, M. le Commandant W. T. Sampson et M. le Professeur Cleveland Abbe.
France: M. A. Lefaivre et M. Janssen.
Grande-Bretagne: Sir F. J. O. Evans, M. le Professeur J. C. Adams, M. le Lieutenant-Général Strachey et M. Sandford Fleming.

Guatémala: M. Miles Rock.
Hawaïï: Hon. W. D. Alexander et Hon. Luther Ahold.
Japon: M. le Professeur Kikuchi.
Libérie: M. W. Coppinger.
Mexique: M. Leandro Fernandez et M. Angel Anguiano.
Paraguay: M. le Capitaine John Stewart.
Bays-Bas: M. G. de Weckherlin.
Russie: M. le Major-Général Stebnitzki et M. J. de Kologrivoff.
Saint-Domingue: M. de J. Galvan.
Suède: M. le Compte Carl Lewenhaupt.
Suisse: M. le Colonel Émile Frey.
Turquie: Rustem-Effendi.
Vénézuéla: Señor Dr. A. M. Soteldo.

Sont absents:

Denemark: M. C. S. A. de Bille.
Salvador: M. Antonio Batres.

M. le PRÉSIDENT. La première chose à l'ordre du jour ce sont les propositions faites par le délégué de la Grande-Bretagne, le Général Strachey; mais avant que l'on passe à leur discussion le délégué de Saint-Domingue, M. Galvan, demande la permission, comme une question incidente, de lire une communication à la Conférence.

M. GALVAN, délégué de Saint-Domingue. Avant que les séances de la Conférence ne touchent à leur fin, je tiens à faire une déclaration qui sera un hommage de respect aux savants illustres qui ont guidé les décisions de la majorité, et en même temps une réserve de la liberté d'action ultérieure du pays que j'ai l'honneur de représenter.

Le vote négatif de Saint-Domingue dans la question fondamentale n'a été que la conséquence de la proposition d'un méridien international neutre, faite par MM. les délégués de la France, et rejetée par la Conférence.

Saint-Domingue, qui n'avait rien dans le riche inventaire des intérêts liés au méridien de Greenwich, ne dût avoir égard qu'à l'équité, dans le cas du désaccord produit par la proposition des délégués de la France, cette nation à la puissante initiative intellectuelle.

Mais dans la séance dernière j'ai vu avec plaisir une autre proposition de messieurs les délégués de la France, accueillie par la presque unanimité de la Conférence.

Il y a donc lieu de considérer ce fait comme l'augure heureux d'un accord plus complet et aussi unanime, un jour ou l'autre, en faveur des intérêts universels de la science.

Ce jour là sera salué avec un cordial *hosanna* par la République Dominicaine, qui sera toujours prête à apporter aux grands progrès de la civilisation le concours de sa bonne volonté.

M. le PRÉSIDENT. La Conférence a maintenant à s'occuper des propositions présentées par le délégué de la Grande-Bretagne, M. le Général Strachey, et qui vont être lues.

Lecture est donnée de ces propositions:

1. La Conférence adopte l'opinion que, pour les besoins de la vie civile, il sera commode de calculer le temps selon le temps civil local à des méridiens successifs distribués autour de la terre, à des intervalles de temps ou de dix minutes, ou de tout autre multiple intégral de dix minutes, à partir du premier méridien, mais que quant à l'application de ce principe on devra s'en rapporter aux différentes nations ou administrations intéressées.

2. Les dispositions à prendre pour se servir du jour universel dans la télégraphie internationale seront remises à la considération du *Congrès international télégraphique.*

M. le Général STRACHEY, délégué de la Grande-Bretagne. Par suite des opinions exprimées au sujet des propositions que j'ai présentées à notre dernière séance, je me sens forcé de dire que je ne suis pas disposé à demander au Congrès de procéder à un vote. Je m'aperçois que quoique je dusse espérer que ces propositions en substance, c'est-à-dire, dans leurs traits caractéristiques, seraient acceptables, toutefois il existe une difficulté extrême à trouver des expressions exactes qui rendent les idées de chacun, et l'opinion n'est pas unanime sur la meilleure manière de modifier ces propositions.

Le but que je me proposais en offrant ces propositions, c'était plutôt d'obtenir du Congrès qu'il voulût bien décider que le choix de la méthode de compter les heures locales, de telle manière qu'elles se conformassent autant que possible aux heures universelles, soit laissé aux autorités locales ; et que tout ce que le Congrès pourrait faire serait d'offrir quelques principes généraux, tel que celui exposé dans ma proposition. Il n'y avait, naturellement, aucune intention de se servir du jour universel de façon à nuire à l'usage de l'unité de l'heure locale ; et, comme j'ai le droit de croire que l'opinion des délégués sera encore exprimé dans le sens que l'on n'avait aucunement l'intention de rien faire qui pût nuire à cet usage, je vais, maintenant, avec la permission du Congrès, retirer les propositions.

M. RUTHERFURD, délégué des États-Unis. M. le Président, je crois que nous apprécions tous le désir qui a poussé le délégué de la Grande-Bretagne à présenter ces propositions. Son désir est que le Congrès n'ait aucunement l'apparence, par son action, de vouloir incommoder le monde dans l'usage de son heure civile actuelle, ou de toute autre heure qu'il trouverait commode d'adopter, tandis qu'il pense qu'entre les diverses propositions faites en égard à l'heure locale il y en aura qui seront acceptables.

Pourtant je ne puis m'empêcher d'exprimer ma satisfaction de ce qu'il soit arrivé à la conclusion que ces propositions ne sont pas nécessaires.

Il me semble que les propositions déjà adoptées par ce Congrès embrassent toute cette question ; que notre jour universel n'a été créé que pour les besoins auxquels il conviendrait, et qu'il ne doit en aucune façon nuire à l'usage de l'heure civile ou de toute heure normale que l'on trouverait commode de conserver. Il me semble que nos résolutions font ressortir ceci si clairement qu'il est inutile de l'énoncer de nouveau sous une forme négative; je ne puis donc m'empêcher d'exprimer ma satisfaction de ce que ces propositions aient été retirées.

M. SANDFORD FLEMING, délégué de la Grande-Bretagne. M. le Président, avant qu'aucune décision ne soit prise, je voudrais dire quelques mots touchant le sujet qui occupe en ce moment le Congrès.

M. le PRÉSIDENT. Le Congrès n'aura à s'occuper d'aucun sujet si les propositions du Général Strachey sont retirées, et le Président entend que l'objet du Général Strachey en retirant ces propositions était d'éviter une discussion à ce sujet qui ne pouvait pas être menée à bonne fin.

Néanmoins si M. Fleming désire prendre la parole il sera libre de le faire.

M. SANDFORD FLEMING, délégué de la Grande-Bretagne. Je ne désire nullement présenter rien de nouveau à la Conférence.

Ce que j'avais à dire se rapportait au sujet, mais, si les propositions sont retirées et que la Conférence désire y mettre fin, je n'insisterai pas.

Aucune objection n'étant faite, les propositions présentées par M. le Général Strachey à la dernière séance sont retirées.

M. le Comte LEWENHAUPT, délégué de Suède, propose de réunir les

résolutions adoptées par la Conférence dans un acte final, constatant la manière dont chaque résolution a été adoptée.

La Conférence s'ajourne afin de permettre aux délégués d'examiner le projet d'acte final.

A la reprise de la séance, l'acte final est adopté à l'unanimité.

ACTE FINAL.

Conformément à une décision spéciale du Congrès, le Président des États-Unis d'Amérique a invité les Gouvernements de toutes les nations avec lesquelles les États-Unis d'Amérique ont des relations diplomatiques, d'envoyer des délégués pour se réunir avec des délégués des États-Unis d'Amérique à Washington, le 1 octobre 1884, dans le but de discuter et, si possible, de déterminer un méridien propre à servir de zéro commun de longitude et de méridien normal horaire pour tout le globe. Cette Conférence internationale sur le méridien s'est réunie au jour et lieu indiqués, et après des discussions mûres et réfléchies, la Conférence a adopté les résolutions suivantes:

I.

Le Congrès est d'avis qu'il est désirable d'adopter un méridien initial unique pour toutes les nations, au lieu et place des méridiens multiples qui existent actuellement.

La résolution fut adoptée à l'unanimité.

II.

La Conférence propose aux Gouvernements ici représentés d'adopter le méridien passant par le centre de l'instrument méridien de l'observatoire de Greenwich comme méridien fondamental pour les longitudes.

Ont voté pour: Allemagne, Autriche-Hongrie, Chili, Colombie, Costa-Rica, Espagne, États-Unis, Grande-Bretagne, Guatémala, Hawaïi, Italie, Japon, Libérie, Mexique, Paraguay, Pays-Bas, Russie, Salvador, Suède, Suisse, Turquie, Vénézuéla.

Ont voté contre: Saint-Domingue.

Se sont abstenus: Brésil, France.

Oui, 22; non, 1; abstentions, 2.

III.

A partir de ce méridien la longitude sera comptée dans deux directions jusqu'à 180 degrés; la longitude est sera dénommée plus et la longitude ouest moins.

Ont voté pour: Chili, Colombie, Costa-Rica, États-Unis, Grande-Bretagne, Guatémala, Hawaïi, Japon, Libérie, Mexique, Paraguay, Russie, Salvador, Vénézuéla.

Ont voté contre: Espagne, Italie, Pays-Bas, Suède, Suisse.

Se sont abstenus: Allemagne, Autriche-Hongrie, Brésil, France, Saint-Domingue, Turquie.

Oui, 14; non, 5; abstentions, 6.

IV.

La Conférence propose l'adoption d'une heure universelle pour tous les besoins pour lesquels elle peut être trouvée convenable, cette heure ne devra pas empêcher l'usage de l'heure locale ou d'une autre heure normale, qui paraîtrait désirable.

Ont voté pour: Autriche-Hongrie, Brésil, Chili, Colombie, Costa-Rica, Espagne, États-Unis, France, Grande-Bretagne, Guatémala,

Hawaïi, Italie, Japon, Libérie, Mexique, Paraguay, Pays-Bas, Russie, Salvador, Suède, Suisse, Turquie, Vénézuéla.

Se sont abstenus : Allemagne, Saint-Domingue.

Oui, 23 ; abstentions, 2.

V.

Le jour universel doit être un jour solaire moyen. Il devra commencer pour le monde entier à partir de minuit moyen du premier méridien, coïncidant avec le commencement du jour civil et le changement de date sur ce méridien. Ce jour devra être compté de zéro à vingt-quatre heures.

Ont voté pour : Brésil, Chili, Colombie, Costa-Rica, États-Unis, Grande-Bretagne, Guatémala, Hawaïi, Japon, Libérie, Mexique, Paraguay, Russie, Turquie, Vénézuéla.

Ont voté contre : Autriche-Hongrie, Espagne.

Se sont abstenus : Allemagne, France, Italie, Pays-Bas, St.-Domingue, Suède, Suisse.

Oui, 15 ; non, 2 ; abstentions, 7.

VI.

La Conférence émet le vœu qu'on fasse commencer les dates astronomiques et nautiques dans le monde entier à minuit moyen aussitôt que faire se pourra.

La résolution fut adoptée sans vote nominal.

VII.

La Conférence émet le vœu que les études techniques destinées à régler et à étendre l'application du système décimal à la division des angles et du temps soient reprises de manière à permettre l'extension de cette application pour les cas où elle présente de réels avantages.

Ont voté pour : Autriche-Hongrie, Brésil, Chili, Colombie, Costa-Rica, Espagne, États-Unis, France, Grande-Bretagne, Hawaïi, Italie, Japon, Libérie, Mexique, Paraguay, Pays-Bas, Russie, Saint-Domingue, Suisse, Turquie, Vénézuéla.

Se sont abstenus : Allemagne, Guatémala, Suède.

Oui, 21 ; abstentions, 3.

Fait à Washington le 22 octobre 1884.

C. R. P. RODGERS,
Président.
R. STRACHEY,
J. JANSSEN,
L. CRULS,
Secrétaires.

La Conférence décide également qu'une copie des résolutions adoptées par la Conférence sera communiquée au Gouvernement des États-Unis d'Amérique qui a pris l'initiative de convoquer la Conférence sur son territoire.

Cette proposition est adoptée à l'unanimité.

M. RUTHERFURD, délégué des États-Unis, soumet alors la proposition suivante :

La Conférence s'ajourne jusqu'à convocation ultérieure du Président, pour l'approbation des protocoles.

Cette résolution est adoptée à l'unanimité, et à trois heures et demie la séance est levée.

PROTOCOLE VIII.

SÉANCE DU 1er NOVEMBRE 1884.

La Conférence se réunit sur la convocation du Président à une heure de l'après-midi dans la Salle Diplomatique du Département d'État, afin de procéder à l'approbation des procès-verbaux, conformément à la décision prise à la séance précédente.

M. le PRÉSIDENT. Les procès-verbaux en français et en anglais ont été revus par MM. les Secrétaires et envoyés à tous les délégués. Si quelqu'un de nos collègues désire faire quelque rectification, je lui donnerai la parole.

RUSTEM-EFFENDI, délégué de Turquie. Monsieur le Président, j'ai remarqué dans les votes relatifs à la cinquième proposition que j'avais été compté parmi les votants pour l'affirmative. Je déclare que je désirais m'abstenir.

M. le PRÉSIDENT. L'observation de M. le délégué de Turquie sera consignée au procès-verbal.

M. DE STRUVE, délégué de Russie. Avant de nous séparer je demande permission d'exprimer au nom de mes collègues notre sincère gratitude pour l'hospitalité qui a été accordée à la Conférence par le Gouvernement des États-Unis, et en même temps de vous exprimer à vous, M. le Président, nos plus chaleureux remercîments pour la manière parfaite et impartiale avec laquelle vous avez présidé à nos délibérations. Au début nous avions unanimement élu en vous le premier délégué des États-Unis. Actuellement, si c'était à recommencer les sentiments personnels de tous les délégués ajouteraient des raisons puissantes pour l'unanimité de votre élection.

M. le PRÉSIDENT. Messieurs, je me sens très honoré de l'expression de vos bons sentiments envers le Président de cette Conférence, et je vous en remercie de tout cœur. Le devoir dicté à tous n'a pas été sans difficulté, mais nos séances et nos discussions ont été caractérisées par une grande courtoisie et amabilité, et par un esprit de conciliation.

Avec la patience et le dévouement, Messieurs les délégués de ce Congrès ont cherché à remplir le devoir qui leur a été confié, et comme Président je vous prie d'accepter mes remercîments les plus cordiaux pour la considération toute flatteuse que vous m'avez témoignée. M. le Président des États-Unis et M. le Secrétaire d'État me prient de vous renouveler leurs remercîments de votre présence ici, et leurs meilleurs souhaits pour un heureux retour dans votre patrie. Je m'estimerai toujours très heureux lorsque j'aurai le plaisir de rencontrer un de mes collègues de la Conférence Internationale.

M. RUTHERFURD, délégué des États-Unis. M. le Président, Messieurs, je suis certain que vous vous joindrez tous à moi pour passer la proposition suivante:

La Conférence vote des remercîments à MM. les Secrétaires pour la manière habile avec laquelle ils se sont acquittés de leurs devoirs qui ne laissaient pas que d'être très ardus.

Cette résolution fut adoptée à l'unanimité.

M. le Général STRACHEY, délégué de la Grande-Bretagne. Je désire, Monsieur le Président, comme un des Secrétaires, exprimer mes remercîments de la façon dont mes travaux ont été appréciés par MM. les délégués présents. Quelque fatiguants qu'aient pu être mes devoirs, je n'ai point de doute que tout autre à ma place n'eût apporté ses soins les plus assidus pour s'acquitter de ces devoirs.

Monsieur JANSSEN, délégué de France. Messieurs, avant la séparation de la Conférence, M. Cruls et moi désirons remercier tout particulièrement nos collègues de l'honneur qu'ils nous ont fait en nous chargeant de la version française des procès-verbaux. Pour répondre à cet honneur nous avons surveillé avec tout le soin dont nous étions capables la traduction des discours qui, cette fois, ont été donnés *in extenso*. Nous n'avons eu qu'un regret, c'est que, pour répondre au désir de plusieurs de nos collègues que leurs devoirs obligeaient à ne pas prolonger leur séjour à Washington, nous avons dû hâter le travail, principalement pour les dernières séances et laisser les traductions à peu près telles qu'elles nous ont été remises, sans pouvoir y apporter, au point de vue de la langue, les retouches désirables.

Sur la proposition de M. Janssen l'assemblée vote des remercîments à M. le délégué de Turquie, qui a prêté son concours gracieux à MM. les Secrétaires pour la révision des procès-verbaux.

M. le PRÉSIDENT. Avant l'ajournement final de la Conférence, je veux faire savoir mon appréciation de la capacité, de la fidélité et du zèle avec lesquels M. W. F. Peddrick, le Secrétaire désigné par le Département d'État pour cette Conférence, a rempli ses devoirs difficiles et je tiens à le remercier pour ses services.

La Conférence acceuille cordialement ces observations.

M. le Président prononce la clôture des travaux de la Conférence.

La séance est levée à deux heures.

Le Président:

C. R. P. RODGERS.

Les Secrétaires:

R. STRACHEY,
J. JANSSEN,
L. CRULS.

ANNEXE I.

UNE LOI par laquelle le Président des États-Unis est autorisé à convoquer une Conférence Internationale afin de déterminer et de recommander l'adoption universelle d'un méridien initial unique à employer dans le calcul des longitudes, et dans la fixation et l'introduction d'une heure universelle.

Qu'il soit décrété par le Sénat et la Chambre des Représentants des États-Unis d'Amérique, en Congrès assemblés:

Le PRÉSIDENT des États-Unis est autorisé et invité à envoyer aux Gouvernements de toutes les nations avec lesquelles nous entretenons des relations diplomatiques, une invitation de nommer des délégués pour se joindre à des délégués des États-Unis dans la ville de Washington, à telle époque qu'il jugera convenable de désigner, à l'effet de déterminer un méridien pouvant servir de zéro commun pour les longitudes et l'heure universelle sur tout le globe, et le Président est autorisé à nommer des délégués, dont le nombre ne doit pas dépasser trois, pour représenter les États-Unis à cette Conférence Internationale.

Approuvé le 3 août 1882.

ANNEXE II.

UNE LOI établissant l'ouverture d'un crédit pour diverses dépenses civiles du Gouvernement pour l'année fiscale finissant le trente juin, mil huit cent quatre-vingt-cinq, et autres buts.

Qu'il soit décrété par le Sénat et la Chambre des Représentants des États-Unis d'Amérique, en Congrès assemblés:

Que les sommes suivantes soient, et les mêmes sont par la présente, créditées pour les objets exprimés ci-dessous, pour l'année fiscale finissant le trente juin, mil huit cent quatre-vingt-cinq, savoir:

Au Ministère d'État:

Pour dépenses de la Conférence Internationale pour fixer un zéro de longitude commun et un étendard de mesure du temps, comprenant le prix d'imprimerie et de traductions, pour être dépensé sous la direction du Secrétaire d'État, cinq mille dollars; et le Président est autorisé par la présente à nommer deux délégués pour représenter les États-Unis à la dite Conférence Internationale, en sus du nombre autorisé par la loi approuvée le trois août, mil huit cent quatre-vingt-deux, et qui serviront sans rémunération.

Approuvé le 7 juillet 1884.

ANNEXE III.

[Dépêche circulaire.]

DÉPARTEMENT D'ÉTAT,
Washington le 23 octobre 1882.

MONSIEUR: Le Président a ratifié, le 3 août dernier, une loi votée par le Congrès, dont voici la teneur:

"Le Sénat et la Chambre des Représentants des États-Unis d'Amérique, réunis en Congrès, arrêtent ce qui suit: Le Président des États-Unis est autorisé et invité à envoyer aux Gouvernements de toutes les nations avec lesquelles nous entretenons des relations diplomatiques, une invitation de nommer des délégués pour se joindre à des délégués des États-Unis dans la ville de Washington, à telle époque qu'il jugera convenable de désigner, à l'effet de déterminer un méridien pouvant servir de zéro commun pour les longitudes et l'heure universelle sur tout le globe, et le Président est autorisé à nommer des délégués, dont le nombre ne doit pas dépasser trois, pour représenter les États-Unis à cette Conférence Internationale."

Je juge à propos de constater qu'en l'absence d'une norme commune et acceptée pour la computation du temps pour des objets non-astronomiques, on éprouve des embarras dans les affaires ordinaires du commerce moderne, que cet embarras se fait sentir surtout depuis que l'extention des communications par télégraphes et chemins de fer a réuni des états et des continents qui se servent d'heures absolument différentes, que la question d'un méridien initial unique est discutée depuis des années dans ce pays-ci et en Europe par des sociétés commerciales et des corps savants, que le besoin de l'adoption générale d'une heure normale est reconnu; et qu'on a accueilli favorablement, surtout au sein des Conférences dernièrement tenues en Europe, l'idée que, comme la République des États-Unis a une étendue longitudinale plus ample que celle d'aucun autre pays traversé par des chemins de fer et des lignes télégraphiques, il est convenable que l'initiative pour la convocation d'une Conférence internationale soit prise par son Gouvernement.

Le Président, quoiqu'il ne doute pas du bien qui doit résulter ultérieurement de l'introduction d'une heure universelle, est néanmoins d'avis que l'effort qu'il convient de faire maintenant doit être un effort pour arriver, au moyen de la consultation, à une décision relativement à la désirabilité de convoquer un Congrès international pour l'adoption d'un méridien initial unique. Il s'abstient donc d'inviter les Gouvernements à envoyer des délégués à une conférence devant se réunir à une époque fixe, jusqu'à ce qu'il ait appris quelles sont les vues des principaux Gouvernements du monde par rapport à la désirabilité d'une telle Conférence internationale.

Je suis donc chargé par le Président de vous prier d'appeler sur cette question l'attention du Gouvernement de ———, par l'intermédiaire de son Ministre des Affaires Étrangères, afin de savoir si son appréciation du bien qui doit surgir pour le commerce intime des peuples civilisés de la considération et de l'adoption de l'heure universelle proposée s'accorde assez avec celle du Gouvernement des États-Unis pour qu'il soit disposé à accepter une invitation à prendre part à une Conférence internationale à convoquer à une époque future peu éloignée.

Vous pouvez laisser copie de cette dépêche entre les mains du Ministre des Affaires Étrangères, et l'inviter à vous faire connaître, le plus tôt possible, les vues de son Gouvernement sur cette question.

Je suis, Monsieur, votre obéissant serviteur,

FRED'K T. FRELINGHUYSEN.

ANNEXE IV.

[Dépêche circulaire.]

DEPARTEMENT D'ÉTAT,
Washington, le 1er décembre 1883.

MONSIEUR: Par ma dépêche circulaire datée du 23 octobre 1882, vous avez reçu communication du texte d'une loi du Congrès ratifiée le 3 août 1882, par laquelle le Président des États-Unis est prié d'inviter les autres Gouvernements à nommer des délégués pour se réunir à la ville de Washington, afin de s'occuper du choix d'un méridien initial unique et de l'introduction d'une heure universelle, et vous avez été chargé d'appeler sur ce sujet l'attention du Gouvernement auquel vous êtes accrédité, et de lui faire savoir que le Président jugeait à propos de ne pais faire, formellement, l'invitation en question, avant d'avoir appris, au moyen d'une consultation préalable, les vues des principaux Gouvernements du monde sur la désirabilité de convoquer une telle Conférence internationale.

Dans le courant de l'année qui vient de s'écouler, le Gouvernement des États-Unis a été informé par la plupart de ceux avec lesquels il a des relations diplomatiques, qu'ils approuvent le dit projet, tandis que plusieurs lui ont fait savoir qu'ils l'acceptent et qu'ils ont même nommé leurs délégués.

Outre cet accueil favorable de la proposition ainsi faite, la Conférence géodésique qui s'est réunie à Rome au mois d'octobre dernier, a témoigné son intérêt dans la réforme projetée en exprimant son avis en faveur de l'adoption du méridien de Greenwich comme méridien initial unique, et s'est ajournée en laissant à la Conférence qu'on se propose de convoquer à Washington le soin de discuter cette question et d'adopter définitivement le méridien sus-mentionné, ou bien un autre qui y soit équivalent, et, en même temps, la rédaction des règles en conformité desquelles cette adoption doit avoir lieu.

Le Président est par conséquent d'avis que le moment est arrivé maintenant pour convoquer la Conférence dont il est question dans ma susdite dépêche circulaire du 23 octobre 1882. Je suis donc chargé par le Président de vous prier d'inviter le Gouvernement de ———, par l'intermédiaire de son Ministre des Affaires Étrangères, à se faire représenter par un ou plusieurs délégués (dont le nombre ne doit pas dépasser trois) chargés de se réunir avec les délégués des États-Unis et des autres nations, dans une Conférence qui doit s'assembler à Washington le 1er octobre 1884, afin de discuter les points indiqués, et, s'il est possible, de faire choix d'un méridien initial unique et d'introduire une heure universelle.

Vous chercherez au plus tôt l'occasion d'appeler sur cette invitation l'attention du Ministre des Affaires Étrangères, et lui donnant copie de la présente dépêche, et en le priant de vous faire connaître la réponse de son Gouvernement.

Je suis, Monsieur, votre obéissant serviteur,

FRED'K T. FRELINGHUYSEN.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. DOC. No. 15.

ANTONIO DE SALAZAR LAND CLAIM.

LETTER

FROM

THE SECRETARY OF THE INTERIOR,

TRANSMITTING

Report of the surveyor-general of New Mexico in the case of the New Mexico private land claim No. 132—*Antonio De Salazar.*

DECEMBER 8, 1884—Referred to the Committee on Private Land Claims and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, December 4, 1884.

SIR: Pursuant to the requirement of the eighth section of the act of July 22, 1854 (10 Stat., 308), I have the honor to transmit herewith the report of the surveyor-general of New Mexico in the case of the New Mexico private land claim No. 132—Antonio de Salazar.

I also transmit copy of letter of the Commissioner of the General Land Office forwarding said report to me.

Very respectfully,

H. M. TELLER,
Secretary.

The Hon. the SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., December 1, 1884.

SIR: I have the honor to forward herewith the report of the United States surveyor-general for New Mexico, in duplicate, in the case of the private land claim "Antonio de Salazar," being No. 132 of New Mexico private claims, to be transmitted to Congress for its action thereon.

Very respectfully, your obedient servant,

N. C. MCFARLAND,
Commissioner.

Hon. H. M. TELLER,
Secretary of the Interior.

ANTONIO DE SALAZAR, NO. 132.

UNITED STATES SURVEYOR-GENERAL'S OFFICE,
Santa Fé, N. Mex., October 31, 1884.

I, Clarence Pullen, surveyor-general of the United States land office of New Mexico, do hereby certify the annexed copies of the following described papers are true and literal exemplifications from original papers on file in this office, viz:

No. 1.—Claimant's petition.
Exhibit A.—Originals in Spanish.
Exhibit B.—Official translation.
Exhibit C.—Sketch map.
No. 2.—Testimony of witnesses.
No. 3.—Brief of claimants.
No. 4.—Opinion of H. M. Atkinson, surveyor-general.

In witness whereof, I have hereunto subscribed my name and caused the seal of this office to be affixed, at the city of Santa Fé, on the day, month, and year above written.

[SEAL.]

CLARENCE PULLEN,
Surveyor-General.

ANTONIO DE SALAZAR—*File* 191—*Reported No.* 132.

CLAIMANT'S PETITION.

Hon. HENRY M. ATKINSON,
United States Surveyor-General, New Mexico:

Your petitioners, citizens of the United States, the heirs and legal representatives of Antonio de Salazar, deceased, owners and claimants of a certain tract of land lying and being situate in the County of Rio Arriba, and Territory of New Mexico, respectfully represent that the said land was granted to the said Antonio de Salazar by the governor and captain-general of New Mexico, then a province of Spain in Mexico, on the 25th day of August, 1714, on his petition praying for the same, with the following boundaries: On the north, the junction of the Chama and the Del Norte Rivers, and a line thence west to the hills; on the south, the boundary of the grant to the Indian Pueblo of Santa Clara; on the east the Del Norte River, and on the west the hills, as will appear from the old Spanish muniments of grants now among the Spanish and Mexican archives in your office, marked as file No. 829, and hereinafter described and referred to.

Your petitioners further represent that the said paper, file 829, was among the archives of the Mexican Government at Santa Fè, at the time of the cession of New Mexico to the United States by Mexico, and was thereupon transferred to your office, and has remained therein to the present time, among and as of said Spanish and Mexican archives, and your petitioners pray that the said paper 829 be taken therefrom and placed with this their said claim and made a part thereof.

Your petitioners further represent that the said paper 829 is the original and a genuine paper, and the same consists of a single document, which they designate and request be marked A and be accompanied with a translation thereof in English, herewith filed, marked B, and which shows, first, the original petition of the said Antonio de Salazar to the said governor and captain-general for the said land and the entry of the filing of said petition on August 25, 1714; second, the original decree or grant made as aforesaid to the said Antonio de Salazar, and commanding that he be placed in royal possession of said granted premises, dated August 25, 1714; third, the original act of possession of the chief alcalde and war captain, dated August 31, 1714, certifying the due execution of the said granting decree, by placing the said Antonio de Salazar in royal possession of the land; and fourth, the original certificate, dated November 14, 1716, given by the visitor general, appproving and confirming the said grant to the said Antonio de Salazar.

Your petitioners further represent that the boundaries aforestated of the said granted premises are clear and explicit, well known, and easily identified, and your petitioners herewith present a sketch plat, marked C, showing the locality and the size of the said tract, with all the accuracy available, where a prior survey has not been had.

Your petitioners further represent that the said grantee, Antonio de Salazar, and his successors, have always been in the uninterrupted possession and enjoyment of the said land from the time it was granted as aforesaid to the present time, and are now in possession and enjoyment of the same, and that they have never known and do not now know of any claim thereto adverse to their own.

Your petitioners pray that their said claim be investigated and passed upon by your honor at an early day, under the treaty of Guadalupe Hidalgo with Mexico

and the law of Congress establishing your office, and providing for the adjustment of Spanish and Mexican grants for land in New Mexico, and that the land claimed by your petitioners under said grant be surveyed and set apart to your petitioners at the expense of the Government.

RAMON SALAZAR,
For himself and the other claimants,
By SAMUEL ELLISON,
Attorney.

A.—*File* 829.

En esta Vª de Stª Fee de la Nª Mexco en 25 de Agosto de 1714 la prestº el contenido ante el Sor Govor y Capn Grāl.—No. 385.

Sor Governor y Capitn. Genl.:

Antonio de Salazar, vezino de la Jurisdicion de la Cañada y Villa de Nueba de Santa Cruz, paresco ante V. S. en la mejor forma qe aya lugar y al mio combenga y digo que esta un sitio de tierras en la otra vanda del Rio del Norte que antiguamento era y posseya mi abuelo, el Capitn Alonso Martin Barba, y aora esta yermo y despoblado, y representando derecho por mi parte en el parentesco que refiero lo rejistro para gosarlo Y y dar les parte a mis hermanos Ygualmte cuyos linderos son de la parte del Norte unos corrales de piedra qe pueden sevir de mojoneras, por la del poniente donde se reconocieren los linderos del Alferez Salvador de Santiesteban, por la del sur los qe se reconosieren de las tierras del Dapitn Joseph Naranjo, y por la del oriente con el Rio del Norte, la quales dhas. tierras pido y supco a V. S. nos las adjudique con sus entradas y salidas para lavores como antiguamente las tenia y gosava dho. mi abuelo portanto.

A V. S. pido y supco sea servido de azernos dha. mersed, y qe senos de de ellas la real possesion. Juro en forma de derecho no ser de malisia este pedimto y en lo nessesario &a.

ANTONIO DE SALAZAR. [Rubric.]

Y vista por mi, Dn Ju. Ygnazio Florez Mogollon, Govor y Capn Grāl deste Reino y Provinzas de la Nª Mexico por S. M., Laube por presentada en su real nombre por el prestе leago la mrzd de dho. sitio de tierras sin perjuizio de terzero de mejor derlcho, y que este auto le sirva de bastante titulo en forma, pra que las gozen por iguales partes; el dho. i sus hermanos; y mando al Alcalde maior de la Villa nueva de Santa Cruz Capn Sevastian Martin le de aesta parte y sus hermos la posesion real expresando los linderos asi lo provei, mande y firme con mi Seco de Gon y Grra qn tomara la razon en el libro de su cargo que es fecho en esta Vª de Stª Fee de la Nueva Mexce en veinte y sinco de Agosto de mill setezos y catorze as. Y se entiende averlo depoblar en el termino de seis meses, como S. M. manda, y de otra forma no balga esta mrzd.

DON JUAN INACIO FLOREZ MOGOLLON. [Rubric.]

Por mdo del Sor Govor y Capn Grāl.

ROQUE DE PINTTO. [Rubric].
Secro. de Gon. y Guerra.

En dho. dia Thome la Razon. [Pintto's Rubric.]

En este Puesto de la Junta de el Rio de Chama con el del Norte, en treinta y un dias de el mes de agosto de este año de mill cetezos y catorze, yo, el Cappn Sevastian Martin, Alcalde mayor y Cappn a Guerra de la Villa Nuª de Stª Cruze y su Jurisdicion, en virtud de el auto proveido pr el Sr Govor y Cappn Grāl de este Rno Paze a al reconosimto de el sitio rexistrado por el contenido y aviendolo echo le di la pozezion rl en nombre de su Mgd a Antto de Zalazar, presediendo las deligensias que el derecho dispone tiro piedras a ranco sacate y dio voses como suyo proprio y aviendole paseado por dho. sitio, yo, dho. Alcalde mayor, le señale por linderos por la parte de el norte La Junta de los Rios el de Chama con el de el norte corriendo este lindero derecho desde dha. Junta al poniente, por la parte de el snr asta el lindero de el Pueblo de Stª Clara, por el oriente el Rio de el Norte, por el poniente las lomas; y para que conste de esta deligensia le di la presente de que doi fee; y aviendo paresido antte mi, dho. Alcalde mayor Juan de Atienza, con la mrd. que gosa como su padre y hermano dixo que si esta parte le per Judicara en dho. sitio como constava de informasion no podia perder el derecho y que sino gozase dho. Anttº de Slazar, y a este dho se combino el dho. Anttº de Salazar, y dixo que de tener derecho dho. Ju. de Atiensa alguna parte de las Registradas se las dexaria libre gozandolo de mas que de dho. Registro tiene mrrd., y en esta conformidad lo firme antte mi, como Juez Receptor, con los testigos de mi Asisttª en dho. dia. Ut supra.

A ruego de Diego de Sebastian Martin Archuleta. [Rubric.]

FRANCO. DE LA MORA. [Rubric.]

Ttestto. de Asistta.:

MIGUEL DE QUINTANA. [Rubric.]

Villa nueba de Santa Cruz y nobienbre catorze de mill setesientos y deis y sies años se presento por el contenido ante mi el General Juan Paes Hurtado en la Visita Juridica que Vista por mi mando se acomule a las otras que de orden del señor Gov^{or} se recopieron y en vista de todas se determinara en Justizia y se la dara el lugar que com venga v para que conste lo firme con el secretario de Gov^{on} y Guerra en dho. dia.

JU. PAEZ HURTADO. [Rubric.]
Visitor. Genl.

Ante mi:

MIGUEL THENORIO DE ALBA. [Rubric.]
Srio. de Govor. y Guerra.

B.—*File* 191.

His Excellency the Governor and Captain-General:

I, Antonio de Salazar, resident of the jurisdiction of the cañada and new village of Santa Cruz, appear before your excellency in due legal form, and state that there is a tract of land on the other side of the Rio del Norte, which was formerly [of] and was possessed by my grandfather, Captain Alonzo Martin Barba, and which is now waste and unsettled, and I, representing a right on my part in the ancestry I refer to, do register the same to enjoy it myself and give a portion to my brothers equally; and whose boundaries are on the north side some rock corrals, which may serve as landmarks, on that of the west where the boundaries of Ensign Salvador de Santiesteban shall be ascertained, on that of the south those which shall be ascertained as those of the lands of Captain Joseph Naranjo, and on that of the east the Rio del Norte, which said lands I ask and pray your excellency to adjudge to us, with their entrances and exits for fields, and as they were formerly held and enjoyed by him, my said grandfather.

Therefore I ask and pray your excellency to be pleased to make to us said grant, and that we be given royal possession thereof. I declare in legal form that this petition is not through dissimulation and as may be necessary, &c.

ANTONIO DE SALAZAR.

At this village of Santa Fé, N. Mex., on the 25th of August, 1714, the petitioner presented this before his excellency the governor and captain-general.

And examined by me, Don Juan Ignacio Flores Mogollon, governor and captain-general of this kingdom and provinces of New Mexico for His Majesty, I treated the petition as presented in his royal name. I do hereby make the grant to him of said tract of lands without prejudice to any third party with a better right, and that this decree shall serve him as a sufficient title in form, so that the aforesaid and his brothers may enjoy the same in equal parts, and I command the chief alcalde of the new village of Santa Cruz, Captain Sebastian Martin, to deliver to this party and his brothers the royal possession setting forth the boundaries.

Thus I provided, commanded, and signed, with my secretary of government and war, who will make the entry in the book under his charge. And this is done at this village of Santa Fé, of New Mexico, on the twenty-fifth of August, year one thousand seven hundred and fourteen.

And it is understood that he has to settle the same within the term of six months, as His Majesty commands, and if otherwise let this grant not hold.

DON JUAN IGNACIO FLORES MOGOLLON.

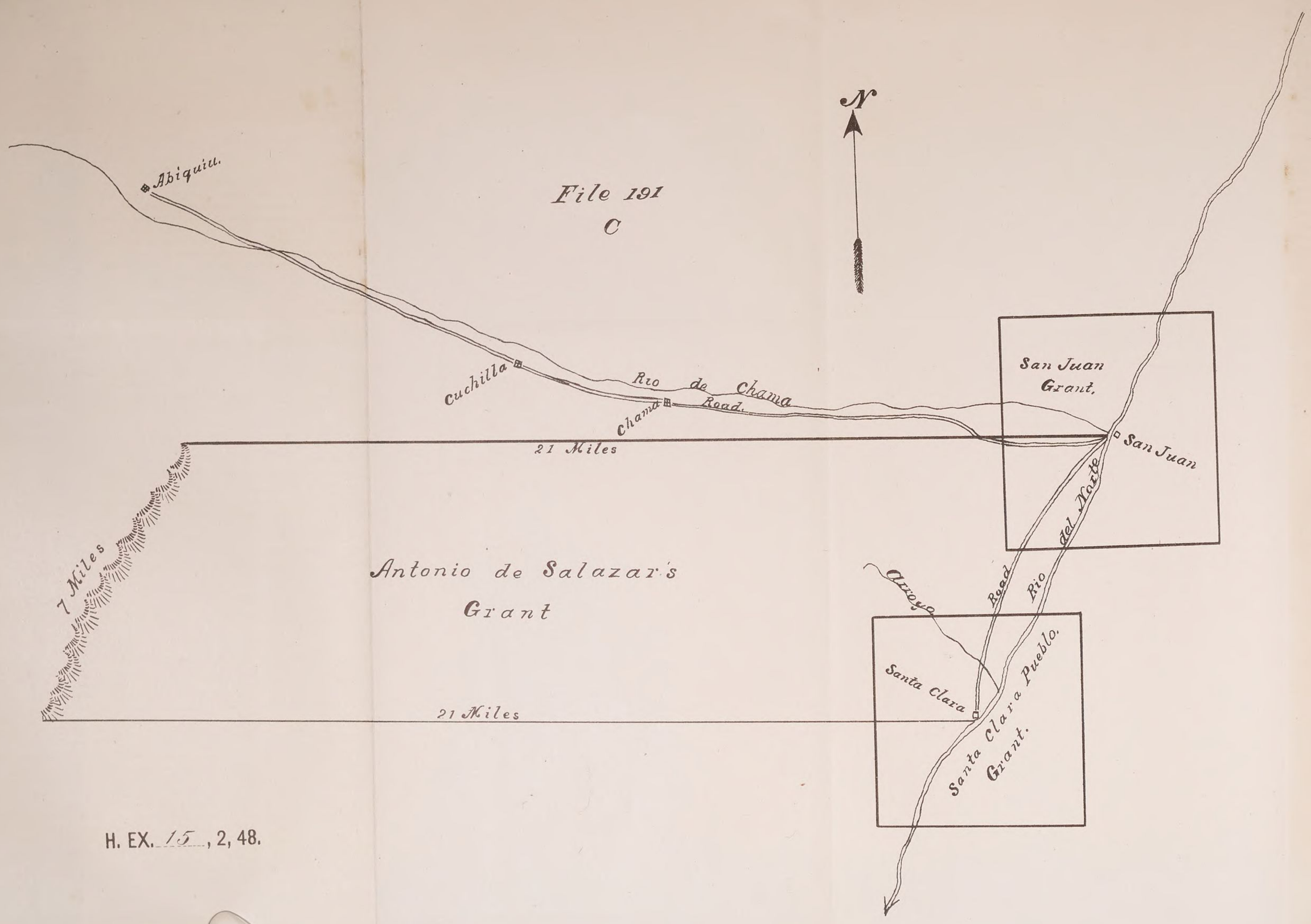
By command of his excellency the governor and captain-general.

ROQUE DE PINTTO,
Secretary of Government and War.

On said day I made the entry [de Pintto's Rubric].

At this place, the junction of the Chama River with that of the del Norte, on the thirty-first day of the month of August, of this year one thousand seven hundred and fourteen, I, Captain Sebastian Martin, chief alcalde and war captain of the new village of Santa Cruz and its jurisdiction, in virtue of the decree made by his excellency the governor and captain-general of this kingdom, proceeded to the examination of the tract of land registered by the petitioner; and having done so, I gave the royal possession in the name of His Majesty to Antonio de Salazar, prior the proceedings which the law directs; he cast stones, plucked up grass, and shouted as being his own, and having conducted him over said tract, I, said chief alcalde, pointed out to him as boundaries on the north side the junction of the rivers, that of Chama with that of the del Norte, this boundary running direct from said junction to the west, on the south side to the boundary of the pueblo of Santa Clara, on the east the river del Norte, on the west the hills; and that it may so appear of this proceeding, I gave him the present to which I certify; and Juan de Atienza, having appeared before me, said chief alcalde, with the grant which he enjoys like his father and brother, declared that if this party should prejudice him in said tract, as appears from informa-

File 191
C



H. EX. 15, 2, 48.

tion, he could not lose the right; and if not, the said Antonio de Salazar might enjoy it, and to this declaration the said Antonio de Salazar agreed. And he stated that if the said Juan de Atienza had a right in any part of the lands registered, he would leave them free, enjoying thè remainder to which of said registry he has a grant; and with this understanding I signed this before myself, as special justice, with the witnesses of my attendance on said day. Ut supra.

SEBASTIAN MARTIN.

At the request of Diego de Archuleta.

FRAN'CO DE LA MORA.

Attending witness:

MIGUEL DE QUINTANA.

New village of Santa Cruz, November 14, 1716, this was presented to me, General Juan Paez Hurtado, by the petitioner, on my judicial visit, and being examined by me I commanded that it be attached to the others, which, by order of his excellency the governor, were collected, and in view of all it will be determined in justice, and to it will be given the proper place; and that it may so appear, I signed this, with the Secretary of Government and War, on said day.

JUAN PAEZ HURTADO,
Visitor-General.

Before me—

MIGUEL THENORIO DE ALBA,
Secretary of Government and War.

The foregoing translation made by me is, to the best of my knowledge and belief, a correct translation of the original in Spanish.

SAM'L ELLISON.

SURVEYOR-GENERAL'S OFFICE,
Santa Fé, N. Mex., January 8, 1883.

The forgoing translation, having been by me compared with its original in Spanish and found correct, is hereby adopted for the official translation.

DAV. J. MILLER,
Translator.

TESTIMONY OF WITNESSES.

In the matter of the investigation of private land claim, file No. 191, grant to Antonio de Salazar, in Rio Arriba County, investigation commenced September 12, 1882.

Present, Henry M. Atkinson, surveyor-general; David J. Miller, translator; Samuel Ellison, attorney for claimants.

CANDELARIO SANDOVAL, having been first duly sworn, deposeth and saith:

By Mr. ELLISON:

Question. State your name, age, occupation, and place of residence.—Answer. My name is Candelario Sandoval; my age is 67 years; my occupation is a laborer; and my residence is here, at Santa Fé.

Q. How long have you lived at your present place of residence?—A. About ten years.

Q. Where did you live before you came to Santa Fé?—A. In Rio Arriba County.

Q. Are you acquainted with a grant commonly known as and called the Salazar grant?—A. I do know such a tract.

Q. Where is it situated?—A. In Rio Arriba County and in New Mexico.

Q. State, if you know them, the boundaries of the grant in question.—A. On the north, the junction of the rivers del Norte and Chama; on the south, the line of the Indians of the Indian pueblo of Santa Clara; on the east, the Rio del Norte; and on the west the high hills.

Q. What is the distance between the said junction of rivers to the said line of the Indian pueblo?—A. About three leagues and a half, somewhat more or less.

Q. What is the distance between the said Rio del Norte and said sierras altas or high hills?—A. Four leagues, somewhat more or less.

Q. How do you know the boundaries you have stated are the boundaries of the grant in question?—A. I was for ten years a peon of the Salazars, and I heard these boundaries mentioned as those of their grant in conversations among the old people.

Q. How long did you live on or near the grant?—A. I was born upon the grant, and my parents lived and had their possessions upon it. I lived also upon it until twenty-two years old, when I married, and thereafter lived thereon twenty-nine years, when my wife died, and after her death I lived thereon fifteen years as a widower.

Q. State the names of some of the settlers you first knew there.—A. The deceased, Casimiro Salazar, Luis Salazar, José Manuel Salazar, Juan Domingo de Herrera, Atanacio Serna.

Q. Has the place ever been abandoned since you have known it?—A. No; it has never been abandoned, but is in possession of the descendants of the first settlers.

Q. Are you interested in the grant in question?—A. No; I have no interest whatever in it.

By the SURVEYOR-GENERAL:

Q. Do you know of your own knowledge that there is any grant covering the tract of land you have described?—A. I do.

Q. How do you know it?—A. I know it from having lived so long upon the land and among the people living thereon, and from having so often heard the grant mentioned in conversations, though I have never seen the grant papers themselves.

Q. Then all you know about it is from what you have heard others say, is it not?—A. Only from what I heard the old people mention.

Q. How do you know that the persons occupying this land since your acquaintance with it were descendants of the original grantees?—A. From having often heard the settlers refer to their predecessors as the Salazars and as the first settlers on the land.

Q. Whom did you ever hear say anything about it?—A. I heard the grandsons and great grandsons of the Salazars say so.

Q. Who were they? Give the names of some of them.—A. They were those I have already mentioned, to wit, Casimiro Salazar, Luis Salazar, José Manuel Salazar, Juan Domingo de Herrera, Atanacio Serna, now all deceased, and others, who referred often to a grant made by the King to the Salazars. This I often heard mentioned, as I lived among the people and had ample opportunity to hear them talk.

his
CANDELARIO +- SANDOVAL.
mark.

Sworn to and subscribed before me this 12th day of September, 1882.

H. M. ATKINSON,
Surveyor-General.

JOSÉ APOLINARIO MONTOYA, being by the surveyor-general duly sworn, on his oath declares:

By Mr. ELLISON:

Question. What is your name, age, occupation, and place of residence?—Answer. My name is José Apolinario Montoya; my age is seventy-two years; my occupation is farmer; and my residence is at Guchupangue, in the county of Rio Arriba and Territory of New Mexico.

Q. How long have you lived there?—A. I was born in Santa Cruz de la Cañada, in the same county, and have lived at Guchupangue fifty years.

Q. Are you acquainted with a grant of land reputed to be that of the Salazars? if so, state where it is situated.—A. I am. On the del Norte River, in Rio Arriba County, and Territory of New Mexico.

Q. State its boundaries, if you know them?—A. On the north the Chama River, where it joins the del Norte River; on the east the del Norte River; on the south the league of the Indian pueblo of Santa Clara; and on the west the Sierra Alta.

Q. What is the distance from the Rio del Norte to the Sierra Alta?—A. About four leagues—a little more or less.

Q. What is the distance between the junction of the Chama and del Norte Rivers to the Santa Clara grant?—A. About three leagues, somewhat more or less.

Q. Please give the names of some of the settlers upon the land when you first knew it?—A. Antonio Salazar, now dead, Luis Salazar, José Manuel Salazar, Miguel Salazar, all now deceased, and I do not recollect now any others of the old settlers.

Q. How far is it from Guchupangue, where you live, to the tract in question?—A. About half a mile, or a little more.

Q. Has the place ever been abandoned since you have known it?—A. It has not.

Q. Have you any interest in the grant in question?—A. I have not any at all.

By the SURVEYOR-GENERAL:

Q. How do you know whether there is any such grant as you have mentioned?—A. I have never seen the grant for the land, but have often heard it spoken of among the old inhabitants of the tract.

Q. To whom do you understand the grant was made?—A. To the Salazars.

Q. What relation, if any, were the Salazars you speak of as having known to the grantees?—A. They were their descendants.

Q. How long have you known this grant?—A. More than about sixty years.

JOSÉ APOLINARIO MONTOYA.

Sworn to and subscribed before me this September 12, 1882.

H. M. ATKINSON,
Surveyor-General

BRIEF OF CLAIMANTS, JANUARY 4, 1883.

In the matter of the claim of Ramon Salazar *et al.* to the grant of land made to Antonio de Salazar, on the 25th day of August, 1714.

It appears by the documents of title filed in this case that the grant was made on the 25th day of August, 1714, and the grantee placed in juridical possession thereof, in accordance with the ordinances, customs, and usages of the Government of Spain, in the Indians, regulating the disposal of the public domain.

These documents of title were found among the archives (Spanish and Mexican) in the city of Santa Fé, Territory of New Mexico, as appears by the records of the office of the surveyor-general of the said Territory (see file No. 829). The fact of their being found in the public archives is *prima facie* evidence of their genuineness and validity.

The testimony of the witnesses produced on the part of the claimants shows a peaceable and uninterrupted possession for the period of over fifty years, and having heard that their ancestors had lived there from time immemorial. From the public record of the documents of title, and a possession from time immemorial, the presumption of law, both of the civil law of Spain and Mexico, as well as the English common law, is in favor of the validity of the grant.

Under the Governments of Spain and Mexico great force was given to the fact of long possession, and the person in possession had the presumption in his favor of being the owner, and having acquired the right of proprietorship, if he had held quiet and peaceable possession for any length of time. Title was presumed, from immemorial possession, when "persons of good character depose to having seen the person in possession of the property for forty years, that they never heard anything to the contrary" (White, 1st vol., 95,349, sec. 21), and by the Royal Regulations of October 15, 1754, it was provided that "If persons have not warrants, their proof of long possession shall be held as a title by prescription." (White, 2d vol., 64, sec. 4.)

By the terms of the eighth article of the treaty of Guadalupe Hidalgo it was provided that "properties of every kind existing in the said Territories, and which now belong to the Mexicans * * * shall be inviolably respected."

The title to the grant of land herein claimed was valid not only under the sovereignty of Spain, but would not have been questioned under the laws of the Republic of Mexico.

It is already proven that the claimants, or those under, by, or through those whom they deraign their title, were possessed of this tract of land at the date of the said treaty.

As to the authority of the officers making the grant, the courts of the United States in giving effect to the treaties with foreign nations, and especially those whereby lands have been ceded, have established just and liberal rules, assenting to the spirit as well as the letter, for the adjudication of titles of private property, and individual claims to grants made under the former sovereignty.

In case of Strother *vs.* Lucas (12 Peters, 416) the court says, "No principle can be better established by the authority of the court than the acts of an officer to whom a public duty is assigned by his King, within the sphere of that duty are *prima facie* to be taken within his power. The principles on which it rests are believed to be too deeply founded in law and reason to be successfully assailed. He who would controvert a grant executed by the lawful authority, with all the solemnities required by law, takes on himself the burthen of showing that the officer has transcended the powers conferred upon him, or that the transaction is tainted with fraud. When the act of the officer to pass the title to land according to the Spanish law is done contrary to the written order of the King, without any explanation, it shall be presumed that the power has not been exceeded, that the act was done on the motive as set out therein, and according to some order known to the King and his officers, though not to his subjects, and courts ought to require very full proof that he had transcended his powers before they so determine it."

The force of the principle above set forth is more readily apprehended when the fact is remembered that, at the time of making this grant, New Mexico was a Spanish province, that the Government of Spain was an absolute monarchy, that its laws were not its legislative acts, "they were the will and pleasure of the monarch expressed in various ways; if it was expressed in any it was the law, there was no other law-making, law-repealing power; call it by whatever name, a royal order, an ordinance, a cedula, a decree of council or an officer. It was emphatically so in Spain and all its dominions." (United States *vs.* Arredondo *et al.*, 6 Peters, 715–16.)

The court further says in the case of Strother *vs.* Lucas (12 Peters, 436): "This court has also uniformly held that the term grant in a treaty comprehends not only those which are made in form, but also any concession, warrant, order, by permission to survey, possess, or settle, whether evidenced by writing or parol, or presumed from possession." See also cases cited thereon (8 Peters, 466; 9 Peters, 152–170; 10 Peters, 331–40.)

The historical fact that Juan Ygnacio Flores Mogollon, the granting officer named in said grant, was the then Spanish governor of the province of New Mexico at the date of granting the same is well established and authenticated from the Spanish archives of New Mexico, many of which are now in the custody of your office.

From these facts, then,

(1) The documents of title being of record in the ancient public archives;

(2) The proof of immemorial and undisturbed possession;

(3) The proof possession at the date of making the treaty, and the continuous possession since that time;

(4) From the well established rules of evidence, and the principles hereinbefore mentioned and set forth, and the authorities cited in support thereof the presumption of law is, that the grant of land herein claimed is valid, and that by the terms of the said treaty, by the law of nations, by virtue of your instructions from the Secretary of the Interior, given in accordance with the provisions of the law establishing the office of surveyor-general of New Mexico, the title to said grant of land should be approved and confirmed to the claimants.

SAM'L ELLISON,
Attorney for Claimants.

OPINION OF SURVEYOR-GENERAL.

Before the United States surveyor-general for the Territory of New Mexico.

THE HEIRS, LEGAL REPRESENTATIVES, AND THEIR assigns, of Antonio Salazar,
v.
THE UNITED STATES.

This case is presented before me under the 8th section of the act of Congress approved July 22, 1854, and the treaty of Guadalupe Hidalgo.

The muniments of title consist—

First. Of a petition of Antonio de Salazar, for himself and brothers, to the governor and captain-general of this, at that time an ultra-marine, province of Spain, which was presented to the governor August 25, 1714, wherein the petitioner prays for a grant of land in what is now Rio Arriba County;

Second. A grant dated August 25, 1714, to the petitioner and his brothers, in equal parts, the land petitioned for, and directing Captain Sebastian Martin to give "this party and his brothers the royal possession, setting forth the boundaries";

Third. The act of juridical possession dated August 31, 1714, wherein the following boundaries are set forth: On the north side, the junction of the Chama River with that of the North (del Norte), this boundary running direct from said junction to the west; on the south side, to the boundary of the pueblo of Santa Clara; on the east, the Rio del Norte; on the west, the hills;

Fourth. A document dated November 14, 1716, signed by Juan Paes Hurtado, visitor-general, wherein the visitor-general directs the documents in the case to be attached together, in his judicial capacity, which is presumed to be intended as an approval of the grant.

These documents were all found among the old Spanish archives on file in this office, and are no doubt genuine.

The signature to the granting decree of Don Juan Ygnacio Flores Mogollon, the then governor and captain-general, is found to agree with the signature of that official upon other documents previously acted upon by this office, and it is undoubtedly genuine.

The evidence taken in the case shows long-continued possession by the parties holding under the grantees.

The claim is approved to the heirs, legal representatives, and their assigns, of Antonio de Salazar and his brothers, according to the bounndaries set forth in the act of juridical possession. The right to the mineral is excepted from this approval, and all gold, silver, and cinnabar is reserved to the Government for its further disposition, as the right to those metals was not subject to alienation by the local granting authority.

A transcript in triplicate of all the papers in the case will be transmitted to Congress for its action.

HENRY M. ATKINSON,
United States Surveyor-General for New Mexico.

UNITED STATES SURVEYOR-GENERAL'S OFFICE,
Santa Fë, N. Mex., January 8, 1883.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 16.

SEBASTIAN DE VARGAS'S LAND CLAIM.

LETTER

FROM

THE SECRETARY OF THE INTERIOR,

TRANSMITTING

Report of the surveyor-general of New Mexico in the case of the New Mexico private land claim No. 137—Sebastian de Vargas.

DECEMBER 8, 1884.—Referred to the Committee on Private Land Claims and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, December 5, 1884.

SIR: Pursuant to the requirement of the eighth section of the act of July 22, 1854 (10 Stat., 308), I have the honor to transmit herewith the report of the surveyor-general of New Mexico in the case of the New Mexico private land claim No. 137—Sebastian de Vargas.

I also transmit copy of letter of the Commissioner of the General Land Office forwarding said report to me.

Very respectfully,

H. M. TELLER,
Secretary.

The Hon. the SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., December 1, 1884.

SIR: I have the honor to forward herewith the report of the United States surveyor-general for New Mexico, in duplicate, in the case of the "Sebastian de Vargas" private land claim, being No. 137 of New Mexico private claims, to be transmitted to Congress for its action thereon.

Very respectfully, your obedient servant,

N. C. McFARLAND,
Commissioner.

Hon. H. M. TELLER,
Secretary of the Interior.

SEBASTIAN DE VARGAS—No. 137.

UNITED STATES SURVEYOR-GENERAL'S OFFICE,
Santa Fe, N. Mex., October 30, 1884.

I, Clarence Pullen, surveyor-general of the United States land office of New Mexico, do hereby certify the annexed copies of the following described papers are true and literal exemplications from original papers on file in this office, viz:

No. 1.—Deeds in Spanish.
No. 2.—Sketch map.
No. 3.—Claimant's translation.
No. 4.—Official translation.
No. 5.—Petition of claimants.
No. 6.—Testimony of witnesses.
No. 7.—Brief of claimant's attorneys.
No. 8.—Opinion of Clarence Pullen, surveyor-general.

In witness whereof I have hereunto subscribed my name and caused the seal of this office to be affixed, at the city of Santa Fé, on the day, month, and year above written.

CLARENCE PULLEN,
Surveyor-General.

[SEAL.]

SEBASTIAN DE VARGAS.—*File No.* 187.—*Reported No.* 137.

[Torn] itura de Venta Perte [torn] esiente á Jose Maria Montoya y traspasado a José Migel Griego, a Antonio Madrid, a Biterbo Ribera, a Manuel Padilla, a Manuel Ribera, a Julian Ribera, este año d. 1808.

En esta Villa de S^{ta} Fee, en dies y siete dias del mes de setienbre de mil setesientos y ochenta y dos años, ante mi, D^{n} Antt^{o} José Ortiz, Alc^{de} mayor de dha. Villa, paresio presente el soldado Juan de Urioste, a quien doy fee, conosco y dijo que vendia y con hefeto vendio a Jose Maria Montoya, vesino de la Sienegilla, Juridision desta Villa, hasa ver: Un rancho que tiene en el aroyo Ondo con una casa y tieras de labor y sus hejidos, y son sus linderos por la parte del norte el camino de Pecos, y por el sur el camino que baja de Pecos á los Serrillos, y por el oriente unos serros negros, y por el poniente el camino de en medio que biene de Galisteo, cuya casa y rancho se la vende y vendio por el presio y cantidad de tresientos pesos de la tierra, los que confeso a ver rese vido a toda su satisfasion y contente, y que si mas vale ó baler pueda de la demasia le ase grasia y donasion pura, mera, perfeta, ynrebocable, que el derecho yama yntervibos, y seloda con sus entradas y salidas usos y costumbres q^{e} a dho. rancho tenia con libre facultad de que pueda darlo, venderlo ó henajenarlo segun fuere su boluntad y que nole pondra pleyto nide manda alguna por si, sus hijos, herederos y susesores, y si alguno selo pusiere que no sea oydo en juysio. Ni fuera del para todo lo cul obliga su persona, bienes a vidos y por a ver, a el sanamiento desta escritura de venta y sesomete a las reales jutisias de su Majestad para que lo con pelan y a premien a el yntegro cunplimiento desta escritura, y el nominado Jose Maria Montoya asi lo otorgo y aseto; y dijo que renunci todas y cualesquiera lelles, requisitos y sircustansias que a su fabor, ablen y me rogo que como Alc^{de} mayor desta Villa ynter pusihera mi autoridad y judisial decreto hoyo dicho Alcalde dijo que lo anteponia eynter puse cunto por derecho mes consedido y no firmo. Por no saber firmelo, yo dho. Alc^{de} con los testigos de mi assitenia con los q^{e} a Utuo a falta describanos publico ni real que de ninguna clase los ay en esta Governasion; que de todo doy fe.

ANTT^{o} JOSE ORTIZ. [Rubric.]
ANTONIO HORTIZ. [Rubric.]
MIGEL HORTIZ. [Rubric.]

En la Villa de Santa Fee, en veinte y ocho diâs del mes de henero deste año de mil ochosientos ocho, ante mi Dn. Antonio Ortis, alcalde ordinario de esta dha. villa y su Jurisdision, comparesieron Jose Maria Montolla y Jose Migel Griego, Antonio Madrid, Manuel Padilla, Bitervo Ribera, Manuel Ribera, y Julian Ribera, todos vesinos desta villa, á quienes doy fee, conosco y dijo el expresado Jose Maria Montolla que sede y traspasa a los seis arriba mensionados, la anterior escriptura de venta q^{e} tenia otorgada a su favor del Rancho del Arrollo Ondo, con todos sus usos y constumbres, segun y como en dha. escriptura constan sin demereto en linderos, ni en ninguna otra cosa, por haverles vendido dho. Rancho por el presio y cantidad de sincuenta pesos de la tierra que cada uno de los seis indibiduos le tienen entregado y el vendedor confiesa haver recebido á toda su satisfasion y contento, por cuio motibo da este traspaso de escriptura a los interesados, para que lo gosen ampliamente como sullo, sometiendose el vendedor a todos los requisitos a que se somete en dha. escriptura el que a dho. vendedor le otorgo la escriptura, con toda su fuersa, requisitos y validasion, y tambien declaro a [torn], ni el vendedor haverlo echo con consentimiento de todos su hijos y

MAP

OF THE

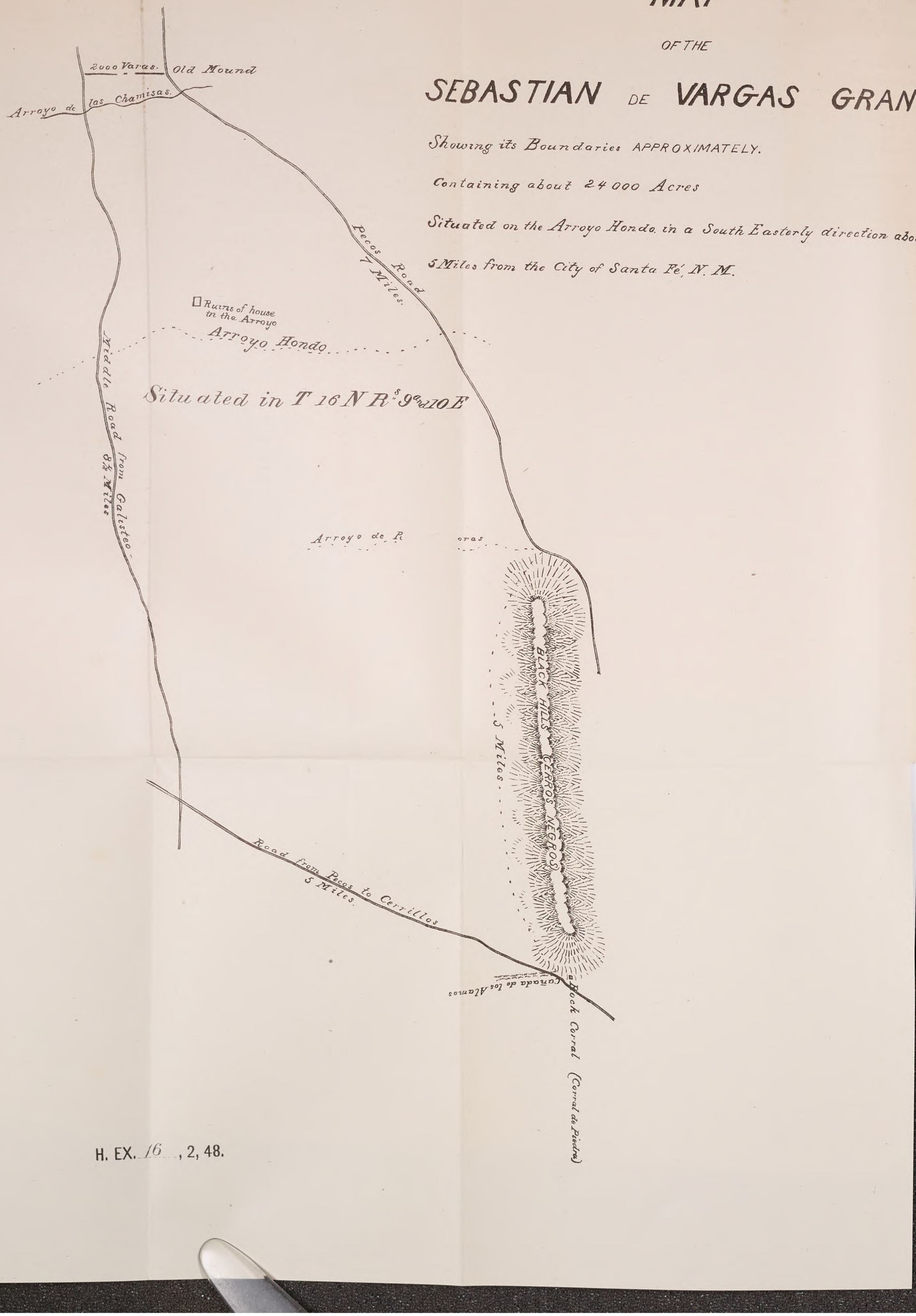
SEBASTIAN DE VARGAS GRANT

Showing its Boundaries APPROXIMATELY.

Containing about 24 000 Acres

Situated on the Arroyo Hondo in a South Easterly direction about

5 Miles from the City of Santa Fé, N. M.


2000 Varas.
Old Mound
Arroyo de las Chamisas.
Pecos Road
7 Miles.
Ruins of house in the Arroyo
Arroyo Hondo
Situated in T 16 N R.s 9a.nd 10 E
Arroyo de R oras
Trails from Galisteo 8½ Miles
BLACK HILLS CERROS NEGROS
5 Miles
Road from Pecos to Cerrillos 5 Miles.
Cañada de los Alamos
Rock Corral (Corral de Piedra)

H. EX. 16, 2, 48.

muger [*torn* todo lo cual]; paso ante mi y me suplico que para la mayor fuersa y validasion deste traspaso interpusiera mi autorida y Decreto Judisial, e yo dho. Alcalde dixo que la interpuse é interpongo quanto por derecho me es conferido. Doy fee, conosco a el otorg^te^ quien no firmo por no saver heselo yo con los de mi asistensia actuando por reseptoria á falta de escribano publico ni real que de ninguna clase los hay en esta Probinsia; que de todo doy fee.

ANTONIO ORTIZ. [Rubric.]

A^sa^: JOSE MEGL. TAFOYA. [Rubrica.]
A^sa^: FRAN^co^ BACA. [Rubric.]

TERRITORIO DE N. M.,
Condado de Santa Fé:

Certifico yo, el abajo firmado, que el antecedente documento ha sido enrejistrado por mi hoy, el dia 26 de Sept. de 1879, en el libro de rejistro, letra "Y," páginas 450 & 451 & 452.

En fe de lo cual pongo mi mano y sello hoy el dia 26 de Sept. de 1879.

[SEAL.]

LUCIANO BACA,
Eno de la Cte. de Pbas.

At this village ofSanta Fé, on the 28th of January, 1808, before me, Antonio Ortiz, ordinary alcalde of this said village and its jurisdiction, personally appeared José Maria Montoya, resident of this said village, with whom I certify I am acquainted, and said that he sold and in effect did sell to the following six individuals, who are José Miguel Griego, Antonio Madrid, Manuel Padilla, Manuel Rivera, Biterbo Rivera, Julian Rivera, all residents of this said village, to wit, a ranch he has on the Arroyo Hondo with an abandoned house and cultivatable lands and commons; and that he acquired said ranch by purchase from the retired soldier, Juan de Urioste, and its boundaries are on the north side the Pecos road, and on the south the road that comes down from Pecos to the Serrillos, and on the east some black hills (Serros Negros), on the west the middle road coming from Galisteo, which ranch he sells to them and did sell for the price and sum of $300 currency of the country, which sum he has received from the six individuals, each one having delivered to him $50, which makes the amount of $300, and he acknowledges to have received to his satisfaction and content; and should it be or become of greater value he gives and donates to them the excess purely, solely, perfect, and irrevocably, which the law terms *intervivos*, and that he gives the same, with its entrances and exits, uses and easements, pertaining to said ranch, with full power to give, sell, or alienate the same as they may deem proper, and he for himself will not bring any suit nor make any demand therefor, nor for his children, heirs, and successors, and if any should bring such suit, they shall not be heard in nor out of court. For all of which he obligates his person, estate, present and future, to secure the validity of this document of sale, and submits himself to the royal justices of His Majesty, that they may compel and obligate him to fully comply with this document, and the said José Maria Montoya thus executed and made the same; and he stated that he renounced all and every law, requirements, and conditions that are in his favor; and he requested me that, as chief alcalde of this village, to interpose my authority and judicial decree, and I, said alcalde, said that I would and did interpose it as fully as I am empowered by law, and he did not sign, not knowing how. I, said alcalde, with my attending witnesses, signed the same, with whom I act for lack of a public or royal notary, there being none of any kind in this province. To all of which I certify.

ANTONIO ORTIZ.

Witness:
JOSÉ MIGUEL TAFOLLA.
FRANCISCO BACA.

SURVEYOR-GENERAL'S OFFICE,
Santa Fé, N. Mex., August 2, 1870.

The two foregoing pages contain a true copy of its original, existing, filed in this office.

T. RUSH SPENCER,
Surveyor-General of New Mexico.

TERRITORY OF NEW MEXICO,
County of Santa Fé:

I, the undersigned, clerk of the probate court in and for said county and Territory, do hereby certify that the foregoing document has been duly recorded by me in book letter Y of record kept in this office for such purposes, on pages 453 and 454 of said book.

In testimony whereof I hereunto set my name and the seal of the probate court this 27th day of September, A. D. 1879.

LUCIANO BACA,
Clerk,
By JOSÉ ORTIZ Y BACA,
Deputy.

[Translation.]

SEBASTIAN DE VARGAS.—*File No.* 187.—*Reported No.* 137.

Instrument of conveyance belonging to José Maria Montoya, and transferred to José Miguel Griego, to Antonio Madrid, to Biterbo Rivera, to Manuel Padilla, to Manuel Ribera, to Julian Ribera, this year of 1808

In this village of Santa Fé, on the 17th day of September, 1782, before me, Don Antonio José Ortiz, chief alcalde of said village, appeared present the soldier Juan de Urioste, whom I certify I know, and stated that he had sold and in effect did sell to José Maria Montoya, a citizen of La Cierreguilla, jurisdiction of this village, to wit, a ranch which he has in the Arroyo Hondo, with a house and farming lands and its commons; and its boundaries are on the north side the Pecos road, and on the south the road that comes down from Pecos to the Cerrillos, and on the east some black hills, and on the west the middle road that comes from Galisteo, which house and ranch he sells and did sell for the price and quantity of three hundred dollars (currency) of the country, which he acknowledged to have received to his entire satisfaction and contentment; and if it is or may be worth more, of the excess he makes to him gift and donation, pure, simple, perfect, and irrevocable, which the law terms *intervivos*, and he gives it to him with its entrances and exits, uses and customs, that he had to said ranch, with full power to give, sell, or alienate it, as might be his will, and no suit nor claim will be brought against him by himself, his children, his heirs and successors, and if any one should bring it let him not be heard either in or out of court.

To all which he binds his person, his estate, present and future, to the security of this instrument of conveyance, and he submits himself to the royal justices of His Majesty, that they urge and compel him to the complete fulfillment of this writing; and the said José Maria Montoya so declared and agreed, and said that he renounces all and any laws, requisites, and circumstances that may be in his favor, and he requested me as chief alcalde of this village to interpose my authority and judicial decree, and I, said alcalde, declared that I would and did interpose it, as is allowed me by law. He did not sign, not knowing how. I, said alcalde, signed it with two witnesses of my attendance, with whom I act for lack of a public or royal notary of which there are none of any kind in this government. To all which I certify.

ANTONIO JOSÉ ORTIZ. [Rubric.]
ANTONIO HORTIZ. [Rubric.]
MIGUEL HORTIZ. [Rubric.]

In the village of Santa Fé, on the 28th day of the month of January of this year, one thousand eight hundred and eight, before me, Don Antonio Ortiz, ordinary alcalde of this said village and its jurisdiction, appeared José Maria Montolla and José Miguel Griego, Antonio Madrid, Manuel Padilla, Bitero Ribera, Manuel Ribera, and Julian Ribera, all citizens of this village, whom I can certify I know; and the said José Maria Montolla declared that he cedes and transfers to the six above-mentioned persons the foregoing instrument of conveyance, which he had executed in his favor for the Arroyo Hondo ranch, with all its uses and customs, according to and as they appear in said instrument, without demerit in boundaries nor in any other thing; to have sold to them said ranch for the price and quantity of fifty dollars (currency) of the country that each one of the six individuals has delivered to him; and the vender confesses to have received to his entire satisfaction and contentment, for which reason he gives this instrument of writing to the interested parties in order that they may fully enjoy it as theirs. The vender submitting himself to all the requisites to which he, who executed to said vender the instrument, submits himself in said instrument, with all its force, requisites, and validity; and the vender also declared before me that he did it with the consent of all his children and wife; all of which took place before me, and he requested me for the greater force and validity of this conveyance to interpose my authority and judicial decree; and I, said alcalde, declared that I did and do interpose it as much as by law is conferred upon me. I certify that I know the grantor, who did not sign, not knowing how. I did it with those of my attendance, acting by appointment for lack of a public or royal notary, of which there are none of any kind in the province. To all which I certify.

ANTONIO ORTIZ. [Rubric.]

Attendance:
JOSÉ MIGUEL TAFAYA. [Rubric.]
Attendance:
FRANCISCO BACA. [Rubric.]

TERRITORY OF NEW MEXICO,
County of Santa Fé:

I, the undersigned, certify that the foregoing document has been recorded by me this 26th day of September, 1879, in record book letter Y, pages 450, 451, and 452.

In testimony of which I place my hand and seal this the 26th day of September 1879.

[SEAL.]

LUCIANO BACA,
Clerk of the Probate Court.

SURVEYOR-GENERAL'S OFFICE,
Santa Fé, N. Mex., October 27, 1884.

The foregoing five pages contain a full and correct translation of the original in Spanish on file in this office.

WILL. M. TIPTON,
Assistant Translator.

Before United States surveyor-general for the Territory of New Mexico, under section 8, act of Congress July 22, 1854.

THE HEIRS, LEGAL REPRESENTATIVES, AND ASSIGNS OF Sebastian de Vargas
vs.
THE UNITED STATES.

To the surveyor-general of the Territory of New Mexico:

Your petitioners, Cecilio Griego, Francisco Griego, Josefa Griego, Eugenio Griego, Andres Sena, Santiago Griego, Francisco Montoya, Juan Lopez, Hario Lopez, José Miguel Griego, Cruz Gutieres, Calos Griego, Vicente Garcia, Magdalena Lucero de Ortiz, Polito Montoya, Juan Lopez 2d, Manuel Montoya, Rafael Lopez, Andres Garcia, José Maria Rodrigues, Apolonia Rodrigues, Antonio Garcia, Gabriel Rivera, Abraham Gold, Esquipula Baca, Pablo Rivera, Juan José Rivera, José Maria Rodrigues 2d, Rita Domingueo, José Maria Padilla, Ramon Padilla, Eustaquio Padilla, Ramon Padilla 2d, Pedro Padilla, Pascual Padilla, Jesus Padilla, Albius Ortega, Andres Rivera, Romulo Rivera, Rumaldo Analla, Francisco Bustamente, Antonio Bustamente, Benito Alarid, Josefa Rivera, Manuel Martin y Garcia, Simon Vigil, Juan Vigil, Martias Domingues, Anastacio Sandoval, and Manuel Gruela, all residents of Santa Fé, San Miguel, and Bernalillo counties, New Mexico, represent—

That they are the owners in fee of a certain tract of land lying and being in the county of Santa Fé and Territory of New Mexico, known as the Sebastian de Vargas grant, and bounded and described as follows: On the north side the old Pecos road, on the east the black hills (Cerros Negros), on the south the road that runs from Pecos town to the Cerrillos, and on the west the middle road from Santa Fé to Galisteo, comprising 24,000 acres, more or less. That the said land was granted by the King of Spain to Sebastian de Vargas (the exact time of making such grant your petitioners cannot now state, for the reason that the original grant papers and documents pertaining thereto were lost and destroyed among other archives of the Territory of New Mexico about the year 1870, during the administration of William A. Pile as governor of said Territory), and thereafter duly sold and conveyed to José Maria Montoya, and by him thereafter and on the 28th day of January, 1808, sold and conveyed to José Griego, Antonio Madrid, Manuel Padilla, Manuel Rivera, Biterbo Rivera, and Julian Rivera, all residents of the county of Santa Fé, which original deed of conveyance is now on file in your office, and a translation thereof, and the same are marked file No. 187 of the records of your office; and which said original deed and the translation thereof your petitioners beg leave to withdraw from the archives of your office, and that the same may be made exhibits herein, marked A and B.

That your petitioners are descendants and persons who have purchased of the descendants of the said last-mentioned six persons; that no official survey has yet been made of the said land, but the accompanying sketch-map shows approximately the situation and boundaries of the same; that the said private land claim or land grant is a lawful, perfect, and complete title in the private ownership of your petitioners as the only legal representatives and assigns of the said original grantee; that the lands and premises herein described were duly, fully, and effectually severed and segregated from the public domain of Spain, and the same have ever since remained and now are claimed, occupied, and definitely and exclusively vested in your petitioners as legal representatives and assigns aforesaid of the said original grantee in full private ownership absolutely and in fee simple.

That in conformity with and in pursuance of the said royal grant, and claiming thereunder, the said original grantee went into actual possession of all and singular the said granted tract of land, and that ever since the said original grantee, his legal

representatives and assigns, have always maintained the continuous, uninterrupted, exclusive, and peaceable possession and occupation of the same, and that there are no adverse occupants or claimants of the same, to the best of the knowledge, information, and belief of your petitioners.

Wherefore your petitioners, under and in pursuance of section 8 of the United States statute of 1854, establishing your office, respectfully present to you the said private land claim or grant for examination and approval.

P. L. VAN DER VEER,
Attorney for Petitioners.

In the matter of the investigation of the alleged grant to Juan de Urioste, upon the petition of the heirs and assigns of said Urioste, which investigation commenced this 23d day of July, A. D. 1884.

Present: Henry M. Atkinson, United States surveyor-general; Ramon Baca, interpreter; J. H. Knaebel for the United States, and J. P. Victory representing the grant claimants.

CARLOS GRIEGO, being called and sworn, deposeth and says:

Question. State your name, age, occupation, and residence?—Answer. My name is Carlos Griego; my age, sixty-three; my residence has been in Santa Fé; my occupation, laborer.

Q. Are you acquainted with the tract of land in this proceeding known as Sebastian de Vargas?—A. The land grant I have not seen, but a document I have, and know the land.

Q. How long have you known the land, and what are boundaries, and are such boundaries definite and well known?—A. Since I acquired reason, from where the sun comes out are the Cerros Prietos; now these Cerros are "called Cerros de Peñas Negras; where the sun goes down is the Caminito del Medio or middle road to Galisteo. On the south the road that comes from Pecos to Cerillos, and on the north El Arroyo del Chamiso.

Q. State whether this boundaries have been generally recognized, since you have known the property, as the boundaries of the said land?—A. Yes.

Q. Do you know under what title or claim of title the land in question has been occupied since you have been personally acquainted with it?—A. Has been occupied by the heirs, Griego y Riberas.

Q. Are you acquainted with the general reputation in that vicinity as to how this people claimed title to the land in question?—A. Yes.

Q. What is the general reputation in that vicinity among the old residents as to how they claimed title to the land within the boundaries of which you have given?—A. It was originally granted to Sebastian de Bargas, and I do not know how this people obtained the title.

Q. How do you know that the land in question was granted to Sebastian de Bargas?—A. I find out by a land grant, granted to Marquez, and now it belongs to Delgado, and it says that a remaining portion of the land granted to Sebastian de Bargas was granted to Marquez.

Q. Do you know the petitioners in this case?—A. I know the person named in the petition very well.

Q. Do any of the petitioners live upon the land?—A. Yes.

Q. Which of them?—A. Antonio Garcia, Maximiano Rivera, Carlos Griego. Those I know that are living, but good others raise crops there; those that raise crops are Juan José Ribera, Cecilio Griego, Santiago Griego, Ramon Padilla, and good many others that I cannot now recollect.

Q. How long have you lived upon the land?—A. I have lived there since I have the use of reason; I've made several houses in various parts of the land, and they have been sometimes destroyed when I have gone out of the place for short times.

Q. Is the land included within said limits traversed by any water-courses, and if yes, by what water-courses?—A. Yes; by an Arroyo Hondo; water runs there now, only at times.

Q. What, if any, interest do you claim in this tract?—A. By inheritance. I am the heir of José Miguel y Griego.

Q. When did your father die?—A. My father died in 1863.

Q. How many children did he leave?—A. He left eight children—three girls and five boys.

Q. Are they all living?—A. No; four are alive.

Q. Did you ever hear your father speak of the Sebastian de Vargas grant, and if so, state what was said by him?—A. He said that they had that grant, and they had bought said land for the purpose of pasturing and cultivating it.

Q. Did your father ever see the original grant papers?—A. I believe he did, because I used to informed by him that he had seen the papers.

Q. How often had you been informed by your father that he had seen the original grant papers?—A. Nearly every time that we passed by said land grant; an infinite number of times.

Q. Did he say where he had seen the paper?—A. That he had seen them in the hands of Jesus Rivera, now deceased; Donaciano Vigil and Don Albino Chacon declared that they had seen the land-grant papers in the office where the archives were kept.

Cross-examination by Mr. KNAEBEL, on behalf of the United States:

Q. Did you personally ever hear Donaciano Vigil ever make any declaration on the subject of any grant to Sebastian de Vargas?—A. Yes, I did; he declared before me and Juan Garcia.

Q. State when and where did he make that declaration; what did he say in all particulars?—A. I do not remember the time; the office was here in Santa Fé; and he said that he had seen the papers of grant to Sebastian de Vargas, and he had them in his hands. I mean the office of the surveyor-general.

Q. Of what land; did you give the boundaries in your direct examination?—A. Of the land that has several names: Arroyo Hondo, La Chamizalosa, La Chamizalosita, La Espina, La Cañada Ancha, La Cañadita del Acha, La Cañadita de Marcho, La Cañada de la Minita, La Cañada de Pecos, La Cañada del Pueblo, Los Encinos, La Cañada Ancha (again), La Cañada de las Minas, El pueblito, El Arroyo Hondo (again), La Cañada Minita (again), La Cañada de Pecos (again).

Q. When, where, and how were you first informed of the names of Sebastian de Vargas had ever been connected with this land or part of it?—A. I was informed by my father in our house, and we the sons were made known that we had some right to said land. I was informed of said lands by my father since I have had the use of any reason.

Q. When and by whom were you first informed of the boundaries which were given, and what tract of land did you understand such boundaries to designate?—A. I was informed by father, and he showed me the boundaries of the Sebastian de Vargas grant.

Q. Are you acquainted with any old house in the city of Santa Fé reputed to have been the dwelling of Sebastian de Vargas?—A. No.

Questions by the SURVEYOR-GENERAL:

Q. How many people were living on this tract of land when you first knew it?—A. Only five I remember that were living in El Arroyo. Those were all the families living on the grant when I first knew it; they were Riveras, Griegos, and Padillos.

Q. Did they reside there permanently or only during their cropping season or pasturing times?—A. They lived there during summer.

Q. Where did they live during the balance of the year?—A. Here in Santa Fé.

Q. All you know in relation to the tract within the boundaries you have named being a grant is from information derived from others and from what others have told you, is it not?—A. No, sir: I knew it first from information that my father gave me; but I have seen the grant papers, and we have a copy of said papers signed by the surveyor-general and Secretary Miller.

Q. Can you read and write?—A. Yes; I can read and write poorly.

Q. What document is that which you have; what is the nature of it, and describe it?—A. The document cites the boundaries and that it was sold; it was a deed in favor of six buyers. José Maria Montoya gave the deed to José Miguel Griego and others.

Q. Were there any other papers or documents that you have seen in connection, and if so, what papers?—A. I have seen copies of the same deed; I have seen none except deeds.

Q. Then you never have seen any document that purported to be a grant from the Spanish or Mexican Government to Sebastian Vargas for this tract of land?—A. No; I have seen none such.

Q. Then you know nothing from your own personal knowledge about any grant or grant paper to Sebastian de Vargas, do you?—A. No, sir. All that I know is what I have said.

Redirect-examination:

Q. Have any of the heirs built upon the land continuously?—A. Yes, three: Maximiano Ribera, I, and Antonio Garcia.

Q. Has not this tract of land always been known and called as the Sebastian de Vargas tract?—A. The greater part of the people know the land as property belonging to Riberas and Garcias, but we now know it as Sebastian de Vargas grant.

CARLOS GRIEGO,

Subscribed and sworn to before me this 23d day of July, 1884.

HENRY M. ATKINSON,
Surveyor-General.

FRANCISCO ESTEBAN VALDEZ, being called and sworn by surveyor-general, deposeth and says:

Question. What is your name, age, residence, and occupation?—Answer. My name is Francisco Esteban Valdez; and I am going in 2- years of age, by the grace of God; I live in Santa Fé; a hatter and laborer are my occupations.

Q. Are you acquainted with tract of land in question in this proceeding known as Sebastian de Vargas grant?—A. Yes, sir.

Q. How long have you known the same; what are its boundaries, and are such boundaries definite and well known?—A. I know the grant since 1820 of present century. On the east "Las Cerros de Peñas Negras;" before they were known as "Los Cerros Negros"; on the west the "Camino del Medio," or middle road; on the north, "El Arroyo de los Chamizos"; on the south, the road that was called "the Rancheros" road, or road that comes from Pecos to Cerrillos—that comes to Cerrillos. These boundaries are well known by me.

Q. State whether these boundaries have been generally recognized since you have known the property as the boundaries of said land grant?—A. Yes, they have.

Q. Do you know under what title or claim of title the land in question has been occupied since you have been personally acquainted with it?—A. Yes; this land has been known under the name of a deed made by Vargas to Montoya and Urioste.

Q. Do you reside upon the land in question?—A. No.

Cross-examined by Mr. KNAEBEL:

Q. State to what extent you've been acquainted with the property in question, a also what are the sources of your information respecting its title and boundaries?—A. I have pastured my herds in said land for three or four years, and I know the place very well. Señor Jesus Rivera informed me one day while cutting wood in the mountains that I should not chop any more wood from said place, because that and belonged to the Riveras, Griegos, and Madril

Question by Surveyor-General ATKINSON:

Q. Are you acquainted with the general reputation among the people in that vicinity as to the title under which the claimants that you have mentioned held said land, whether by grant or how; and if by grant, to whom was the grant made?—A. Yes; I am acquainted with the general reputation and I know by information. Señor Jesus Rivera told me that they held the land by a grant made to them; and the papers made by Montoya and Urioste were shown to me by Miguel Archibeque; this land grant was made to Señor Sebastian Vargas.

Q. Can you read and write?—A. I could write and read, but now I am short-sighted and tremulous.

Q. When and under what circumstances did they show you this paper that you speak of?—A. I do not remember when; but more or less, eight or ten years ago, during a private conversation.

Q. Did you read the paper?—A. Yes, a few lines I only read, on account of noise in a store; they did not follow reading it, and I did not hear the rest read.

Q. What year were you on the tract as a herder?—A. From the year 1820 to 1824 of present century.

Q. Have you been there since?—A. Yes; I have been there nearly every day. I have gone for wood for the use of my house.

Q. Did those people that lived there at that time live there permanently or just during cropping seasons?—A. They used to live here; but when crop time came, that is, in summer, they lived there.

Q. Have you any interest in this tract of land?—A. No.

his
FRANCISCO ESTEBAN + VALDEZ.
mark.

Subscribed and sworn to before me this 23d day of July, 1884.

HENRY M. ATKINSON,
Surveyor-General.

Don ANASTACIO SANDOVAL, being duly sworn, deposeth and says:

Question. What is your name, age, residence, and occupation?—Answer. My name is Anastacio Sandoval; I am 68 years old; I live in Santa Fé, and my occupation is that of a merchant.

Q. Are you acquainted with the tract of land in question in this proceeding and known as the Sebastian de Vargas grant?—A. Yes, sir.

Q. How long have you known the same, and what are its boundaries, and are such boundaries definite and well known?—A. Well, I know this land since my youth. I know the boundaries; and the boundaries are well known, and they are the following: On the north, the Pecos road; on the south, a road that goes to Cerrillos from

Pecos; on the east, "Los Cerros Negros"; on the west, a middle road that goes to Galisteo.

Q. State whether these boundaries have been generally recognized since you have known the property as the boundaries of a grant, and if so, of what grant.—A. The boundaries have been recognized and known on account of a deed; and I have seen said papers and know them. I cannot say that these boundaries have been recognized as boundaries of a land grant; but I know the boundaries are recognized on account of said deed; and I have said deed now in my pocket; but I am informed that said boundaries are the boundaries of a land grant.

Q. Do you know under what title or claim of title the land in question has been occupied since you have been personally acquainted with it?—A. It has been occupied by some of the owners of the grant; it has been occupied also on account of this title or deed that I just showed; and it has been occupied also on account of Sebastian de Vargas' grant, the way that I have been informed.

Q. How did you get your information in regard to the grant part?—A. I have gotten my information from several old parties, and Mr. Carlos Griego is one of them.

Q. Do you know, or have you ever heard, of the original grant papers to Sebastian de Vargas being on file in the archives of the Territory?—A. I am informed that they are. I was informed by the same Griego and others that declared that they had seen the grant papers, and the name of those that declared were Donaciano Vigil y Albino Chacon.

Q. Is it not a fact that a large number of papers on file in the archives of the Territory were lost, mislaid, and destroyed about the year 1870, during Governor Pile's administration?—A. Yes, and twice before his administration.

Q. Among the papers lost and destroyed were there not some original grants?—A. I cannot say; but that they were lost or destroyed, there is no doubt, during those times. The destruction of papers occurred when the Chimallos came, and also when the rebels came, and this last time, when Governor Pile was here.

Q. Do you know the petitioners in the proceedings?—A. Yes.

Q. Do you know whether any of them have continuously lived upon the land, and, if so, how long?—A. Some have resided continuously, and some of them lived at certain seasons of the year.

Cross-examined by Mr. KNAEBEL:

Q. On what if any facts within your personal knowledge do you base your testimony respecting loss and destruction of archives?—A. I have been living here, but I did not see them destroyed by the Chimallos and rebels; this I have heard from good authorities, but in 1870 I myself saved a sack full of important paper. I bought them from boys who bought them from the man that Governor Pile had selling those papers from archives at auction. I bought said papers so as to pack groceries with.

Q. How many years ago did you first hear of this land designated as the land of Sebastian de Vargas?—A. A little over 15 years.

Q. Have you any interest in this property; if so, what?—A. Yes, I have the part of Antonio José Rivera; they are 50 veras wide and all from north to south.

ANASTACIO SANDOVAL.

Subscribed and sworn to before me this 23d day of July, 1884.

HENRY M. ATKINSON,
Surveyor-General.

Adjourned to 10 o'clock a. m. July 24, 1884.

Investigation resumed this 24th day of July, 1884.

Present, H. M. Atkinson, surveyor-general; Roman L. Baca, interpreter; J. H. Knaebel, attorney for the United States; and P. L. Vanderveer and J. P. Victory for grant claimants.

ALBINO ORTEGA, being duly sworn, deposeth and says:

Question. What is your name, age, residence, and occupation?—Answer. My name is Albino Ortega; I am forty years old; my residence is Santa Fé, N. M.; my occupation is that of a laborer and painter.

Q. Are you acquainted with a tract of land in Santa Fé County commonly called the Sebastian de Vargas grant; if so, how long have you been acquainted with it and what are its boundaries?—A. Yes, I know the land well; I've known the land for twenty-five years; the boundaries, are on the south, the road that comes from Pecos to Cerrillos; on the west, the middle road that goes from Santa Fé to Galisteo; on the north, the Pecos road, that is the road that goes from Santa Fé to Pecos; on the east "Los Cerros Prietos."

Q. Do you know under what title or claim of title the land in question has been occupied since you have been acquainted with it?—A. Yes; I know that the land has been had by a deed, given to six buyers, namely: José Miguel Griego, Antonio

Madriel, Manuel Padilla, Biberbio Ribera, Manuel Ribera, Julian Ribera; this deed was given by José Maria Montoya to the above-named six persons.

Q. Is it not a fact that the tract of land in question was always known as the de Vargas grant, and is it not of general repute among old residents of Santa Fé County that the same was duly granted to one Sebastian de Vargas by the Kingdom of Spain during the life-time of said Vargas; and further, is it not generally reputed and understood among the old inhabitants of Santa Fé County that said tract of land has been occupied and cultivated by said Vargas continuously and his grantee down to the present time?—A. From two old men, namely, Jesus Rivera y Pablo Domingues (deceased now), I know that the land grant was given; and Jesus Rivera told me several times that my grandfather had bought that land grant in company with others, and that the land grant existed in the archives, and that he at that time, when he was living, had seen the land grant there. Domingues told me that he had had the land grant several times, and read it at those various times, and he had said that the land-grant papers recited the same boundaries that the deed gives. I further say that when two of the old original grantees died, in their wills they particularly mentioned the said land grant. I cannot say that Vargas occupied said land, but the buyers and their heirs have occupied it ever since they bought it.

Q. How many people live on the land in question?—A. About five families live there constantly.

Q. Name them, the families, and what relation, if any, do the six grantees named in the Montoya deed?—A. The names of families are the following: Maximiano Ribera, Andres Garcia, Antonio Garcia, Meregildo Martin, Felipe Alarid. Some of them are heirs; the others are buyers. Maximiano Ribera is the only heir of the five; the others are buyers. They have bought the interest of some of the heirs.

Q. What interest, if any, have you in the tract of land in question?—A. The interest that I have is by inheritance. Julian Ribera was my grandfather, and he is one of the six that bought the land.

Question by Surveyor-General ATKINSON:

Q. How often have you been on this land since you've known it?—A. Since the day that I first could reason; I always have been laboring there.

Q. These families that you speak of lived there the entire year constantly or only during their cropping seasons?—A. These families that I have mentioned have been living there for the last few years. Some have lived 10, others 15, and some less; they have been living there all the time.

Q. Who has been living there during the entire time; name them?—A. The same persons that I have already mentioned.

Q. What are you doing on the land in question?—A. I have for many years burned lime, and have also cultivated the ground, and I have fenced in my lands.

Q. You know nothing about there being a grant there, except what Rivera and Domingues told you?—A. I know only what Rivera and Domingues told me.

Q. Who was Rivera an heir of?—A. He was the heir of Biterbo Ribera.

Cross-examined by J. H. KNÆBEL:

Q. Where are the wills that you refer to?—A. I have it at my house.

ALBINO ORTEGA.

Subscribed and sworn to before me this 24th day of July, 1884.

HENRY M. ATKINSON,
Surveyor-General.

LOUIS ANAYA, being duly sworn, deposeth and says:

Question. What is your name, age, residence, and occupation?—Answer. My name is Louis Anaya; I am 64 years old; I live in Santa Fé; I am a tailor.

Q. Are you acquainted with a tract of land in Santa Fé County commonly known as the Sebastian de Vargas grant, and, if so, how long, and what are its boundaries?—A. No.

Q. Are you acquainted with a tract of land formerly conveyed by J. Montoya to Miguel Griego, Antonio Madril, Manuel Pablo, Manuel Rivera, and others?—A. I know the land.

Q. How long have you known it, and do you know its boundaries?—A. The boundaries I do not know, because I have not seen any writing that would show me. I've known the place since I was ten years of age.

Q. Do you know whether said land was occupied and cultivated by any person or persons during the time that you've known it, and, if so, give the names of such persons and how long they so occupied?—A. That land was cultivated and occupied by Jesus Ribera, Ignacio Rivera, Thomas Padia, Santiago Padia, and Antonio Griego. All of these parties are dead, but those men occupied and cultivated the land.

Q. Did the parties that you have just named have houses upon the land, and did

they occupy the same continuously winter and summer with their families?—A. They had houses, but did not live there continuously, only when crop time came.

Q. Did any of the families live there winter and summer?—A. I do not know.

Cross-examined by J. H. KNÆBEL, attorney for the United States:

Q. How much of the said land has ever been cultivated, to your knowledge?—A. I do not know how many varas, I never counted them; but it was considerable cultivated land.

Q. Is it not true that a great many persons, mere squatters, without claim or title, had cultivated parts of the said lands to your knowledge?—A. No; only the heir.

Q. Is it not true that many persons, without claim of title and without permission of any heirs or others claiming title, have been in the habit of pasturing stock and cutting firewood from time to time upon the said land since you have been acquainted with the property?—A. Yes.

Q. Have you any interest, direct or indirect, in these lands?—A. No.

Redirect examination:

Q. Did or did not those parties who pasture and cut wood upon said land have permission from the heirs to so cut and pasture?—A. I do not know.

his
LOUIS + ANAYA.
mark.

Sworn to and subscribed before me this 24th day of July, 1884.

HENRY M. ATKINSON,
Surveyor-General.

ROMAN SANCHES, being duly sworn by the surveyor-general, on oath declares:

Question. What is your name, age, residence, and occupation?—Answer. My name is Roman Sanches; my age I do not know very well, but I am certain that I am over 60 years old. I live in precinct No. 3, in Santa Fé; I am a workingman.

Q. Are you acquainted with a tract of land commonly known as the de Vargas grant, and, if so, how long have you been acquainted?—A. Yes; I know it almost since I was born.

Q. Do you know its boundaries, and, if so, describe them?—A. Yes. On the east, "Los Cerros Negros;" on the west, the middle road; on the south, with lands of the Delgados; on the north, the arroyo de los Chaniezas.

Q. Have you been in the habit of visiting said lands, and, if so, how often?—A. I have been going there since I know it nearly all the time.

Q. During the time that you were acquainted with the land, was anybody living in it and cultivating, and, if so, whom?—A. Yes. Antonio Griego had a house in the arroyo, and he lived there with his family; Jesus Rivera, Santiago Padilla, Ignacio Ribera, those are all. Now there are good many people living there. They used to live there in summer and in winter they would come to Santa Fé; that is, some of them always remained there in winter; Antonio Griego had a house of his own.

Q. Have you any interest in this land or in this proceeding?—A. No.

Q. Do you know anything about how persons who are in possession of this land claimed title to it; if so, tell what you know?—A. I believe the papers to show this were burned up many years ago; they acquired title by purchase, and I've seen many old papers in the hands of Jesus Ribera relating to the grant.

Q. What papers have you seen?—A. I never heard any paper read where the boundaries were cited.

Q. How do you know what the boundaries are?—A. The purchasers told me a thousand times that those were the boundaries.

Q. How do you come to go upon this land?—A. I used to work for Antonio Griego three or four years, and I also used to herd my small number of sheep, goats, and burros in that place.

Q. Were these people that you've mentioned in possession of the land at that time, and did you herd your sheep with their permission or otherwise?—A. Yes, sir; they were in possession; I used to be permitted by them to pasture there, and this were the same persons that claimed to own the land.

Q. Did you know of any other parties claiming or holding possession adversely to the petitioners in this case.—A. No, sir; never.

Cross-examined by Mr. KNAEBEL, United States attorney:

Q. Describe as fully as you can the nature of the papers referred by you in your direct examination and their contents.—A. I heard read that they sold that land to Felipe Alarid and others. Diego Ribera was the man that made the deed.

Q. Did you ever hear of a grant to Sebastian de Vargas, or do you know of any grant?—A. I heard that Riberas, Griegos, Madriles, and others had bought this grant of Sebastian Vargas; that's all I know.

Q. Who told you so?—A. My father, and all the old men of that time.

his
ROMAN + SANCHES.
mark.

Sworn to and subscribed before me this 24th day of July, 1884.

HENRY M. ATKINSON,
Surveyor-General.

Adjourned to July 25, at 2 p. m., 1884.

Investigation resumed this 25th day of July, 1884.
Present, same officers and attorneys as yesterday.

FLORENCIO GARCIA, being first duly sworn, deposeth and saith:

Question. State your name, age, occupation, and place of residence.—Answer. My name is Florencio Garcia; I am 49 years old; I live in Santa Fé, precinct No. 3; I am a laborer.

Q. Do you know a tract of land called the Sebastian de Vargas grant, and, if so, state how long, and tell us all you know about it.—A. Yes, sir; it is about 36 years since I know the tract of land; I know the boundaries well; on the south, a trail, which in former times use to be called the Cerrillos trail, because it went to Cerrillos; on the north, the Chamizos Arroyo and the road that comes from Pecos to Santa Fé; on the east, "Los Cerros Prietos;" on the west, the middle road that comes from Galisteo to Santa Fé. Everybody in Santa Fé has told me that those are the boundaries, and I heard it also from the lips of the six buyers. I knew them well, and I can show what parts of the land each one of them cultivated. I never read any papers on the subject. I've pastured my small herd of goats when I was nine years old; afterwards I sold them, but I continued to go for wood every day till now. All the buyers, their heirs and legal representatives, have occupied said land. I never knew anybody else besides the legal representatives to live upon and cultivate said land. I always have heard it called as the Sebastian de Vargas.

By H. M. ATKINSON, surveyor-general:

Q. Who were the six grantees that you speak of; name them?—A. The names of the grantees were Antonio Griego, Julian Ribera, Jesus Ribera, Manuel Padia, and I do not now recollect the names of the other two, and there was a certain Madril; I don't remember his first name.

Q. Did these men live on the land permanently, or did they only during their cropping season?—A. The men planted there, and were to be seen in that place only during cropping seasons. Some of the heir lived there during winter and summer—Felipe Alarid, Maximiano Ribera, Antonio Garcia, Andres Garcia, the above named, and the persons that I know that have lived there during winter and summer.

Q. Name some of the parties that have told you the boundaries?—A. I know the boundaries from same heirs, and also from many other persons that are not heirs; among those that have told me are Don Pablo Delgado and Felipe Delgado and many others.

Q. When and where did Pablo Delgado and Felipe Delgado told you the boundaries, and under what circumstances?—A. I knew it by having conversations with those persons. I used to go to their houses, and they would tell me. I do not remember what day of the month or year. I think he told me in 1865 or '67, when I was about to start with J. L. Johnson's wagons.

Q. Which side of the road going from here to the Pecos are the Cerros Prietos?—A. They are on the west of the road going from here to Pecos.

Q. What are the Cerros Prietos? Describe them.—A. They are two hills, with so much wood on them that that is the reason they call them prietos. I have no interest whatever in this land grant.

his
FLORENCIO + GARCIA.
mark.

Sworn to and subscribed before me this day the 25th of July, 1884.

H. M. ATKINSON,
Surveyor-General.

No further witnesses being present, documents marked A and B were introduced in evidence as exhibits hereto, and reference is made to file 89 in the case of private-land claim reported No. 53, of this office, and the same is also submitted in evidence in this case.

Whereupon this investigation is closed.

HENRY M. ATKINSON,
Surveyor-General.

Before surveyor-general for the Territory of New Mexico, under section 8, act of Congress July 22, 1854.

THE HEIRS, LEGAL REPRESENTATIVES, AND THEIR assigns, of Sebastian de Vargas
vs.
THE UNITED STATES.

It is well settled that possession of land for a long period of time will raise a presumption of a grant, which will be enforced as against the Government.

The United States *v.* Beebe *et al.*, 4 McCrary, p. 12; Mayer *v.* Horner, Cowper, 102; Jackson *v.* McCall, 10 I. R., 380; Lewis *v.* San Antonio, 7 Texas, 304; 3 Starkie, 1221; 2 Wharton on Evidence, sec. 1348; Rowe *v.* Ireland, 11 East., 230.

The evidence in this case shows that the land in question has been occupied since at least 1808 by the petitioners and their ancestors, under a deed made in that year by Juan de Urioste to six persons who were ancestors of these petitioners.

The boundaries are well defined.

There are no persons living upon the land claiming title adverse to the petitioners.

Reference to the southern boundary of this grant is made in file No. 53 of this office, in the description of the Delegado ranch.

A late decision of Judge Axtell, in the case of Gwyn & Willison *vs.* Nasario Gonzales (tried July, 1884), sustains the same view.

File No. 187 shows the deed made in 1808 which calls for these boundaries.

P. L. VAN DER VEER,
Attorney for Petitioners.

OPINION.

Before the United States surveyor-general of the Territory of New Mexico.

THE HEIRS, LEGAL REPRESENTATIVES, AND THEIR assigns of Sebastian de Vargas
vs.
THE UNITED STATES.

This claim is presented before me under the treaty of Guadaloupe Hidalgo and the eighth section of the act of Congress approved July 22, 1854, establishing this office.

No muniments of title are presented, the claimants alleging that they have been lost or destroyed. They offer as evidence of title two deeds, with a sketch-map accompanying.

One of said deeds, dated September 17, 1782, is from the soldier Juan de Urioste to José Maria Montoya, conveying a tract of land described as "a ranch which he has in the arroyo Hondo, with a house and farming lands and its commons, and its boundaries are on the north side the Pecos road, and on the south the road that comes down from Pecos to the Cerillos, and on the east some black hills, and on the west the middle road from Galisteo." In the second deed, dated January 28, 1808, the said José Maria Montoya (whose name is spelled therein "Montolla") conveys the said described tract to six citizens of Santa Fé, namely, José Miguel Griego, Antonio Madrid, Miguel Padilla, Bitervo Ribera, Manuel Ribera, and Julian Ribera.

Both of said deeds are on the same sheet of paper. With them the claimants presented a translation, which I found to be incorrect, and I had a proper translation prepared in this office, which I have filed with the other papers in the case, and which I have used in preparing my decision. The petition of said claimants was filed in this office June 12, 1884, with the documents and map referred to, and alleges that they are the owners of a certain tract of land lying and being in the county of Santa Fé and Territory of New Mexico known as the Sebastian de Vargas grant, and bounded and described as follows: "On the north side, the old Pecos road; on the east, the Black Hills (cerros Negros); on the south, the road that runs from Pecos town to the Cerillos; and on the west, the middle road from Santa Fé to Galisteo, comprising 24,000 acres, more or less." That the said land was granted by the King of Spain to Sebastian de Vargas. That the exact time of making such grant the petitioners cannot now state for the reason that the original grant papers and documents pertaining thereto were lost and destroyed among other archives of the Territory of New Mexico about the year 1870 during the administration of William A. Pile, governor of said Territory. And the said grant to De Vargas was thereafter duly sold and conveyed to José Maria Montoya, and by him thereafter, on the 28th day of January, 1808, sold and conveyed to José Griego, Antonio Madrid, Manuel Padilla, Manuel Rivera, Biterbo Rivera, and Julian Rivera, all residents of the county of Santa Fé.

The testimony had been fully taken by my predecessor at the time of my assuming the office of surveyor-general, July 29, 1884; the claimants' brief was filed September

16, 1884, and recites "that possession of land for a long period of time will raise a presumption of a grant which will be enforced as against the Government."

The evidence in this case shows that the land in question has been occupied since at least 1808, by the petitioners and their ancestors, under a deed made in that year by Juan de Urioste to six persons who were ancestors of these petitioners.

The strength of the claimants' case lies in the maintenance of the two assumptions of the brief just quoted. There is no record evidence or reference to such a grant in the old Spanish or Mexican files in this office, save that in file No. 89 of the Cañada de las Alamos grant an allusion is made to "land of Sebastian de Vargas" in a paper dated September 23, 1785, said "De Vargas" land being evidently understood therein to be in somewhat the same locality as the tract now claimed as a grant by the petitioners aforesaid. Said file No. 89 is evidently the "Delgado Ranch" referred to in the said petitioners' brief, as no such name occurs in the said files. Excepting such corroborative weight as the above-mentioned allusion to "land of Sebastian de Vargas" may have, the proof of the validity of the grant sought to be established rests solely upon the said deed of Montoya, and the proofs offered by the claimants of long-continued possession.

The question to be considered is whether under the circumstances and the evidence presented a grant may be presumed to have been made to Sebastian de Vargas.

In this case neither the originals nor the testimonials of the petition, the decree or the act of possession of the alleged grant, are presented, the claimants alleging they have been lost or destroyed; the only papers presented are the deeds and sketch-map above referred to.

"To maintain a title by secondary evidence" (says the court in the United States *v.* Castro *et al.*, 24 Howard, 350), "the claimant must show that the grant was obtained and made in the manner the law required at some former time, and that it was recorded in the proper public office, to which it may be added that such was undoubtedly the Mexican law."

In the case of United States *v.* Polack *et al.* (1st Hoffman Land Cases, 284), the court says, "Where the archives contain no evidence or trace of the existence of a grant, the court will demand the fullest and most satisfactory proofs of possession and occupation during the existence of the former Government, under a notorious undisputed claim of title, and clear and indubitable evidence of the genuineness of the grant produced.

"To support a title by secondary evidence, the claimant must show the existence of the record and its loss and destruction, and that he entered into possession under the grant." (Pico *v.* the United States, 2 Wallace, 279; Peralto *v.* the United States, 3 Wallace, 434; the United States *v.* Castro, 24 Howard, 346.)

"The absence from the Mexican archives of evidence supporting the alleged grant creates the presumption against the validity of such a grant, so strong that it can be overcome, if at all, only by the clearest proofs, accompanied by open and continuous possession of the premises." (Pico *v.* the United States, 2 Wallace, 279.)

In case of the United States *v.* Cambuston it was decided that the record evidence of the grant should be produced, or its absence satisfactorily accounted for.

Now, as there is no record of the title of the alleged grant on file in this office, the question is to be determined whether the evidence offered is sufficient to support a title. The testimony produced is unsatisfactory and contradictory. There is a variance as to how the claimants came into possession of the land. The testimony shows that the general reputation is that the alleged grant was originally made to Sebastian de Vargas, but it is not shown that he ever occupied it, and deeded by de Vargas to José Maria Montoya, and by Montoya to the Riveras *et al.* named in the deed produced.

The testimony shows that the land has been mainly occupied during summer in the cropping season by people who lived in Santa Fé the rest of the year. Only one witness testifies to any one living all the year on the land. Another witnesss testifies that many people pastured their herds and cut wood on the land without permission.

There is testimony given of the historical fact of the destruction of the New Mexican archives, by Gov. William A. Pile, in 1870, but there is no evidence establishing satisfactorily that any documents relating to the alleged grant ever were among these archives.

The testimony goes to show that the land in question was not known as the Sebastian de Vargas grant until about fifteen years ago. One witness testifies that he did not know the bounds described in the deed of Montoya were bounds of a land grant, but now was informed that such was the case.

The claimants' petition alleges that said land was granted by the King of Spain to Sebastian de Vargas, and thereafter duly sold and conveyed to José Maria Montoya, and by him thereafter, on January 28, 1808, sold and conveyed to José Griego, Antonio Madrid, Manuel Padilla, and the three Riveras.

Now the deed offered in evidence shows that Montoya acquired the said ranch by

purchase from the soldier Juan de Urioste and sold and conveyed the same to the parties before mentioned, José Griego *et al.*

The testimony of the witnesses is that De Vargas made a deed of the alleged grant to Montoya, and that Montoya conveyed the land to José Griego *et al.* But the deeds produced show that Montoya bought the land from the said soldier Urioste. So there is a great discrepancy between the written documents produced and the oral evidence in support of the alleged grant.

Nor is there anything offered to show that De Vargas ever made a deed to Montoyo. The contrary is shown by the deed produced.

The question arises, if such evidence be deemed presumptive of a grant, might not any descendant of Urioste claim with greater show of reason that the land in question was a grant made to Juan de Urioste?

There is to sustain the assumption of a grant neither paper in the New Mexican archives nor testimonial in the hands of the claimants, nor record that any alcalde ever conferred judicial possession. And the weight of the testimony offered shows that the land in question had not begun to be generally known as the Sebastian de Vargas grant until about fifteen years ago.

The point raised in the claimants' petition, that the continued possession of land for a long period of time raises the presumption of a grant, I cannot regard as to be accepted in so unrestricted a sense, but as to be taken rather only as corroborative of other evidence, when the same exists, of the fact that muniments of a grant had once been made.

In case of Sumner *v.* Child (2 Conn., 607), says, "A grant of land conferring an entire title cannot be presumed from length of time and possession alone, and it is a question of law what circumstances furnish a presumption. A grant will never be presumed from lapse of time unless the lapse of time is so great as to create a belief that it was actually made, or unless the facts in the case show that the party to whom it is presumed to have been made was legally and equitably entitled to it." (Jackson *v.* Moore, 6 Cowper, N. Y., 706.)

Under the law applicable to the ruling point of their petition, and in the light of the evidence offered, I do not consider the claimants to have presented a *prima facie* case, and I hereby disapprove the petitioners' claim of a grant.

A transcript in triplicate of all the papers in the case will be transmitted to Congress for its action in the premises.

CLARENCE PULLEN,
Surveyor-General.

SURVEYOR-GENERAL'S OFFICE,
Santa Fé, N. Mex., October 17, 1884.

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48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 17.

CONTINGENT FUND.

LETTER

FROM

THE SECRETARY OF THE INTERIOR,

TRANSMITTING,

As required by law, a statement of the expenditure of the contingent fund of that Department for the fiscal year ending June 30, 1884.

DECEMBER 8, 1884.—Referred to the Committee on Expenditures in the Interior Department and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, December 4, 1884.

SIR: I have the honor to transmit herewith, as required by section 193 of the Revised Statutes, statement of the expenditure of the contingent fund of this Department for the fiscal year ended June 30, 1884.

Very respectfully,

H. M. TELLER,
Secretary.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

Statement of expenditures on account of the contingent fund of the Interior Department, for the fiscal year ending June 30, 1884.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1883.			
July 10	John L. Ginck	Subscription to Law Reporter 1 year	$3 00
13	Roesser & Son	12 file cases and sections	345 00
16	H. G. Sickel	Carpet, matting, furniture, &c	177 65
17	Jas. S. Topham	30 special agents' trunks and repairs	583 00
19	Burns & Creecy	Erecting 2 combined stand pipes, ladders, &c	1,920 00
19	Susan V. Bird	12 buckets paste	9 00
19	R. B. Bare	1,518 street-car tickets for Indian, Pension, and Education Offices.	60 00
21	John McDermott	Painting and repairing carriage	191 10
23	W. W. Dudley	Traveling expenses to Pittsburgh	31 50
23	do.	Traveling expenses to Syracuse	16 30
28	Kellogg and Johnson	864 pounds brown soap	107 49
28	Chris. Xander	1 empty barrel	1 10
28	J. G. Weaver & Son	14 cases and repairs	76 50
30	Johnson & Bro	10 cords pine wood	55 00
31	L. G. Thompson	Board of 3 horses, 1 month	87 25
31	John Stevens	200 paper book boxes	6 00

Expenditures on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1883.			
Aug. 1	P. Fleming	11 days' board of horse	$8 25
1	John C. Parker	Subscriptions to papers and magazines, 1 year	144 95
1	S. V. Bird	163 gallons paste	40 75
2	John Lanahan	Shoeing horses, 18 shoes	9 00
3	Milne & Proctor	Office furniture	198 11
3	A. S. Allen	25 gallons paste	6 25
4	Gould & Co	Office furniture	111 50
4	W. F. Lutz & Co	Rubber stamps and repairs to same	64 45
4	Middleton & Lingenfelter	Making office furniture and repairs	240 00
4	P. Fleming	11 days' board of horse	8 25
4	Franklin & Co	1 10-inch double-bulb self-registering thermometer.	6 50
4	Middleton & Lingenfelter	Making shelving and repairs to furniture	180 75
7	Michael Niel	Shoeing horses, 32 shoes	12 00
7	Middleton & Lingenfelter	Walnut-desk case, show drawers, &c	102 50
7	James Lingenfelter	Walnut single desk	16 00
7	R. B. Bare	506 street-car tickets, office custodian	20 00
7	Robt. Boyd	Hardware, assorted	55 31
8	Wheatley Brothers	Lumber, selects, &c	230 13
8	Washington Gas Light Co	Gas, Interior Department building, July	130 65
8	....do	Gas, additional buildings, July	163 35
8	....do	....do	3 00
8	Lanahan & Co	Shoeing horses, 8 shoes	4 00
9	Woodward & Lothrop	800 yards sheeting, 4/4 New York Mills	130 00
9	E. H. King	Furniture and repairs to same	172 50
9	John W. Drew	Feather dusters, soaps, &c	72 29
9	Willett & Libbey	Dressed lumber, selects	108 75
9	E. H. King	1 walnut-case, small	12 00
10	John C. Parker	Books, publications, &c	49 30
10	Kellogg & Johnson	1,500 pounds sal-soda	21 45
11	J. G. Weaver & Son	Making 12 sets pigeon holes	72 00
11	W. B. Moses & Son	Office furniture	145 00
11	George Motts	6 pans black harness soap	2 20
11	Adams Express Company	Expressage from Rochester	85
11	John W. Drew	18 5/12 dozen feather dusters	340 70
13	R. C. Hewitt	Forage for horses	100 85
14	National Republican	6 copies, subscription 1 year, 6 Bureaus	36 00
14	E. H. King	Making office furniture and repairs	227 34
14	H. Hollander	Buckets, mops, chamois skins, &c	102 05
14	....do	Water colors, cuspidors, dust-pans, &c	118 99
15	....do	....do	99 94
14	Middleton & Lingenfelter	Making office furniture and repairs to same	180 00
16	Great Falls Ice Company	76,384 pounds ice for 6 Bureaus for July	305 94
17	James S. Topham	10 special agents' trunks and repairs	194 05
17	E. G. Wheeler	200 portfolio quadants	35 00
17	Scheller & Stevens	2 dozen combs	1 28
18	John H. Gheen	11 days' board 4 horses, and hire carriage 1 day	48 85
18	Wyckoff, Seamans & Benedict	1 type writer and repairs	126 70
18	Middleton & Lingenfelter	Repairing furniture	16 00
18	R. B. Bare	51 horse-car tickets	2 00
20	Wm. Ballantyne & Son	1 copying press and stand, &c., also repairs	52 78
20	Jas. Lingenfelter	810 tin card holders and 200 white drawer knobs	23 00
21	H. I. Hart	½ gross insect powder and ½ gross blow-guns	19 50
22	W. E. Cleaver	Medical treatment of horse, 10 visits	20 00
22	J. S. Topham	10 special agents' trunks, rubber corners	190 00
23	Middleton & Lingenfelter	1 large file case	55 75
24	E. J. Hayward	Washing 9,726 towels for 6 Bureaus for July	63 21
24	Charles Fischer	6 magnifying glasses	15 00
25	Wash B. Williams	3 walnut continental chairs and laying 122 yards carpet.	20 23
27	M. W. Beveridge	Sponge, whisk brooms, sweeps, baskets, &c	283 24
27	Middleton & Lingenfelter	6 black walnut office desks, single	189 00
27	O. V. McCarty	1 type-writer and stand	80 00
29	W. F. Lutz	Rubber stamps and repairs, card slides, &c	28 90
29	Wheatley Brothers	Lumber, dressed	94 95
29	J. S. Topham	10 special agents' trunks, rubber corners	190 00
29	N. F. Metzger & Bro	Scrubbing brushes, corn brooms, &c	92 84
20	Sunday Herald	Advertising proposals for fuel	2 00
31	D. Van Nostrand	1 Vegas tables	2 50
31	S. J. Meeks	Repairs to carriage	4 50
Sept. 1	Hosford & Sons	1 New York and 1 Brooklyn City Directory	13 00
1	Middleton & Lingenfelter	Furniture and repairs to same	29 75
1	J. S. Topham	10 special agents' trunks, rubber corners	190 00
1	George Motts	Repairs to harness	2 25
1	S. Fowler	Hauling ashes, &c., from Pension Office	12 00
1	George Bing & Co	Repairing dating stamps	10 00
1	L. G. Thompson	Board 2 horses, August, and use of horse 2 days	51 50
3	S. A. Allen	18½ gallons paste	4 63
3	Bureau of Engraving and Printing.	Engraving and printing 3,996 Pension certificates.	147 85
	S. V. Bird	324 gallons paste	50 62

Expenditures on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1883.			
Sept. 4	C. H. Burgess	Fuel, coal and wood	$342 60
5	Sargent & Greenleaf	Railroad fare, Rochester to Washington and return to open safe.	65 33
5	H. L. Lipman	6 patent eyelet punches	4 50
5	Theodore Smith	1 packing box	50
5	J. G. Weaver & Son	1 walnut case	17 75
5	Washington Gas Light Company.	Gas consumed in August in Department buildings.	316 50
5	A. H. Chase & Bro	Cleaning carpets, Pension and Education Offices.	51 80
6	Western Union Telegraph Company.	Telegraphing, July, Secretary's office	27 43
6	....do	Telegraphing, July, Pension Office	124 17
6	....do	Telegraphing, July, Education Office	5 61
6	....do	Telegraphing, July, Land Office	71 02
6	Joseph Bushman	Medical attendance to horse, 48 hours	20 00
6	Michael Neil	Shoeing horses, 18 shoes	12 00
7	H. J. Hart	Services, man and self using insect powder in Department.	8 00
8	Commercial Advertiser	Advertising	9 60
8	Middleton & Lingenfelter	Making office furniture	293 58
8	Baltimore and Ohio Express Company.	Expressage	80
8	J. L. Hall	Services overhauling locks on safes in disbursing office.	37 40
10	John Stevens	500 pasteboard boxes	15 00
10	C. E. Birckhead	1 case with portfolio drawers	44 94
11	Thomas Hutchinson	2 Chicago City Directories, 1882, 1883	7 00
11	J. H. Pray, Sons & Co	1,000 yards carpet lining	45 00
11	....do	75 yards linoleum	52 50
11	Keuffel & Esser	Mathematical instruments	20 25
11	James Clark	2 Argand burner lamps, pendants, brackets, &c	14 00
11	Cincinnati Commercial Gazette.	Subscription 1 year	14 00
11	W. R. Riley	27¾ yards blue desk cloth	76 31
11	Norfleet & Co	Harness and repairs	15 25
11	George W. Knox	Hauling freight	5 56
12	Middleton & Lingenfelter	Furniture and repair to same	65 50
12	C. E. Birckhead	100 portfolio drawers, shelving, model casing, &c.	802 00
12	C. C. Fulton & Co	Advertising supplies	4 50
12	Sunday Herald	....do	3 00
12	....do	Advertising ice	2 00
12	Washington Daily Post	Advertising supplies	7 00
12	Lee Crandall	....do	2 10
12	G. W. Childs	....do	13 00
12	Daily Post	Advertising ice	3 00
12	New York Mail and Express	Advertising supplies	11 20
12	National Republican	Advertising ice	3 00
12	Evening Star	Advertising fuel	3 17
12	R. Worthington & Co	Advertising supplies	3 75
12	National Republican	Advertising ice	1 50
12	National Republican	Advertising for fuel	8 50
13	....do	Advertising for supplies	2 12
13	E. H. King	Walnut cases, map-rollers, &c	69 25
13	W. O. Berry & Co	2 base-burner stoves and fixtures	32 00
13	W. B. Williams	2 walnut continental chairs	9 42
14	J. M. Young	Repairs to carriages	22 60
14	John Keyworth	21 gross matches	141 65
15	Middleton & Lingenfelter	Furniture and repairs to same	150 00
15	E. H. King	Office furniture and repairs	33 50
15	Conrad Becker	Harness and repairs	64 20
17	Eagle Lock Company	Key blanks	2 09
17	E. W. Woodruff	27 file-holders and 6 dozen file-holders	57 27
17	Lansburg & Bro	150 dozen towels and 1,200 yards ¾ cotton	561 00
17	Francis Miller	7 gallons benzine, 1 brush	2 15
18	H. L. Lipman	1 patent eyelet machine	10 00
18	Bureau Engraving and Printing.	Printing and engraving 26,141 pension certificates.	967 22
18	C. E. Birckhead	1 case portfolio drawers	38 52
18	G. A. Lyon	1 copying press and stand	14 00
19	W. O. Berry & Co	Repairs to stoves, new fittings, &c	24 55
19	John McDermott & Bro	Repairs to office wagon	39 25
19	....do	Repairs to carriage	48 00
19	William Ballantyne & Son	1 hektograph, cap size	7 60
19	C. Becker	1,700 leather straps for files	152 00
20	George Ryneal	Paints, oils, glass, &c	68 66
21	W. S. Hoge	Forage for horse	42 43
21	R. K. Helphenstine	2 dozen hair-brushes	15 50
21	Buxton & Skinner	1 Monitor letter-press and attachments	10 15
21	E. J. Hayward	Washing 8,312 towels for 6 Bureaus, August	54 02
21	J. S. Topham	2 pair saddle-bags	16 00

Expenditures on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1883.			
Sept. 22	W. B. Moses & Son	Office furniture	$240 30
22	Middleton & Lingenfelter	Furniture cases and repairs	144 25
22	Great Falls Ice Company	78,580 pounds ice for August	314 32
22	W. F. Lutz	Rubber stamps and repairs to same	65 15
22	Robert Boyd	Hardware	80 38
24	John C. Parker	Directories, pocket maps, &c	84 90
24	F. H. Maeke	2 rotary office chairs	12 00
24	Robert Beall	Law books	49 00
24	Charles G. Williams	1 bay horse for Indian Office	150 00
24	Charles Fischer	2 magnifying glasses	4 00
25	F. M. Trevoe	Repairs to caligraph	10 00
25	Western Union Telegraph Company.	Telegraphing, August, Secretary's office	9 40
25	....do	Telegraphing, August, Land Office	94 47
25	....do	Telegraphing, August, Pension Office	58 32
25	....do	Telegraphing, August, Education Office	3 07
27	James G. Bates	Regulating tower clock, Thirteenth and Pennsylvania avenue.	2 00
27	Wyckoff, Seamans & Benedict.	Material for type-writers	16 75
28	H. L. Lipman	3 patent eyelet-punches	11 50
28	do	1 patent eyelet machine	14 50
29	Louis Schmid & Son	100 book-boxes	50 00
29	Middleton & Lingenfelter	Map cases and 8 sections pigeon-holes	539 94
29	Wheatley & Bro	Dressed lumber	174 40
29	Adams Express Company	Expressage, Secretary's office	90
29	....do	Expressage, Land Office	1 15
29	....do	....do	16 00
29	....do	Expressage, Pension Office	50
29	....do	Expressage, Education Office	1 35
29	....do	....do	2 60
29	....do	Expressage, Indian Office	1 45
29	....do	....do	55
29	....do	Expressage, Pension Office	80
29	John McDermott & Bro	Repairs to wagon and painting same	73 00
29	Robert Boyd	Tacks	74
Oct. 1	J. C. Ringwalt	2 Rand & McNally's Index Atlas of the World	52 00
1	E. W Woodruff	10 extra size file-holders	39 17
1	....do	18 dozen file-holders and 2 cases with double doors.	246 00
1	George Motts	Repairs to harness	4 80
3	W. O. Berry & Co	Repairs to stoves, new pipe and fixtures	19 87
3	....do	Cleaning stove and flue	2 00
3	....do	Brick-work, repairing flue, blower to grate, &c	5 50
3	Michael Neil	Shoeing horses, 38 shoes	13 75
3	L. G. Thompson	Board, 3 horses, September	67 50
3	O. H. P. Clarke	Pasturing horse 7 days, and ditto 1 horse 1 month and 2 days.	9 70
3	James G. Bates	Winding and keeping in repair 155 clocks, 3 months.	89 51
3	Solomon Fowler	Carting 20 loads ashes	6 00
3	S. V. Bird	200 gallons paste, 4 offices	50 00
3	A. S. Allen	18 gallons paste, 2 offices	4 63
4	Baltimore and Ohio Express Company.	Expressage, Land and Indian Offices	75
4	Robert Beall	6 copies Dunglison's Dictionaries and 1 postal guide.	46 50
5	Middleton & Lingenfelter	Making office desks and cases and furniture repairs.	366 00
5	Baltimore and Ohio Express Company.	Expressage, Secretary's office	65
5	....do	....do	65
5	R. H. Graham	Repairs carriages, Secretary and Pension Offices	2 80
6	R. C. Hewitt	Forage for horses	109 00
6	W. W. Chambers	Care, keeping, and use of horse 3 months	41 00
6	Robert Boyd	Hardware	290 36
6	Charles E. Birckhead	1 book and label case	53 60
6	Washington Gas Light Company.	Gas consumed in buildings of Department, September.	392 40
8	W. R. Riley	38¾ yards blue desk cloth	106 56
8	H. Hollander	Water-coolers, cedar buckets, chamois skins, &c.	58 17
8	E. J. Hayward	Washing 7,787 towels, 6 Bureaus, September	50 61
9	J. W. Sinclair	1 brass stuffing box	5 85
9	Great Falls Ice Company	68,275 pounds ice for Department for September.	273 10
9	Adams Express Company	Expressage for Indian Office	3 20
9	....do	Expressage for Secretary's office	1 80
9	George Ryneal	Paints, oils, varnish, glass, &c	50 20
10	A. H. Chase & Bro	Cleaning carpets and curtains for Department	45 20
10	J. M. Wheatley & Bro	Fuel, building Eighth and G streets	62 44

Expenditures on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1883.			
Oct. 10	J. M. Wheatley & Bro	Fuel, Patent Office building	$1,262 89
10	do	Fuel, Pension Office building	289 69
10	John Keyworth	34 gross matches	217 60
11	W. S. Jenks	2 radiant stoves and fixtures	65 00
11	F. M. Trevoe & Co	Repairing 2 type-writers	45 00
11	Royce & Mareau	Changing and repairs to electric bells	25 20
12	R. J. Hutchinson	102 binders and lettering	137 80
12	E. W. Woodruff	14 file boxes, extra sizes	45 07
12	Thomas Somerville & Son	Brass finishings, hardware, &c	90 62
12	E. H. King	Making 50 map rollers and repairs to furniture	29 98
12	H. V. & H. W. Poor	1 copy Railroad Manual	5 30
12	Adams Express Company	Express-age, Pension	2 00
12	do	Expressage, Education	8 75
13	Middleton & Lingenfelter	Making new desks and cases and repairs to furniture.	294 62
13	George W. Knox	Expressage, Secretary's office	5 38
13	W. B. Moses & Son	Office furniture	91 46
13	do	1,263 yards Brussels carpet	1,580 95
13	J. G. Weaver & Son	Laying old carpets, repairs to furniture, &c	129 79
13	W. F. Lutz	1 French numbering stamp	45 00
15	do	New hand stamps, rubber dies, repairs to stamps, &c.	105 20
15	T. B. Hood	Rent of room, 2 weeks, examinations at Jonesborough.	10 00
15	William Ballantyne & Son	Copying presses, hektographs, ink slabs, &c	102 44
15	E. W. Woodruff	1 dozen file holders, and 250 feet lumber.	14 17
15	Solon Palmer	340 dozen toilet soap	318 40
15	Shelton Brothers	1 pair saddlebags for special examiner in field	10 00
24	Western Union Telegraph Company.	Telegraphing for September, Education Office	2 59
24	do	Telegraphing for September, Land Office	103 92
24	do	Telegraphing for September, Pension Office	84 33
24	do	Telegraphing for September, Secretary's office	15
24	do	Telegraphing for September, Secretary's office	28 58
24	E. G. Wheeler	Hardware	202 34
24	Charles E. Birckhead	46 portfolio drawers, Patent Office	287 88
25	Henry Roesser & Son	32 file cases with sections	565 00
25	R. B. Bare	1,012 street car tickets for Pension and Education Offices.	40 00
25	John McDermott & Bro	Repairs to Land Office carriage	76 50
25	do	Repairs to Department carriage.	36 50
26	C. H. Burgess	Fuel for Interior Department and other buildings.	6,903 18
27	J. G. Weaver & Son	Laying old carpets and repairs to furniture	58 63
27	Middleton & Lingenfelter	10 black walnut single desks, Land Office	300 00
27	W. W. Tupper & Co	32 pieces No. 2 grates, &c., 2,727 pounds	149 98
27	Lansburg & Bro	50 dozen towels	115 00
27	Robert E. Boyd	Repairs to electric wires, &c	3 00
27	A. G. Gedney	1 automatic numbering stamp	45 00
27	W. F. Lutz	Repairs to type-writers	18 50
30	Baltimore and Ohio Telegraph Company.	Telegraphing July, August, and September, Education Office.	8 20
31	Wheatley Brothers	Dressed lumber	170 30
31	Middleton & Lingenfelter	1 pigeon-hole case, Model Hall	155 00
Nov. 1	Samuel West	Hauling 33 loads ashes from Pension Office	11 55
1	Charles Chase	Board of horse, October	25 00
1	Lanahan & Horan	Shoeing horses, 29 shoes	14 25
1	L. H. Schneider & Son	Hardware	93 56
1	J. L. Savage	2,349 label-holders	75 88
2	W. F. Lutz	New rubber dies and repairs to same	12 55
2	E. H. King	500 map-rollers, Land Office	40 00
2	Middleton & Lingenfelter	Repairs to furniture	106 75
2	Robert Beall	Books and book-holders	45 00
2	George Motts	Repairs to harness	4 45
2	L. G. Thompson	Board 3 horses, September	67 50
2	Middleton & Lingenfelter	1 double desk, Patent Office Library	209 00
2	S. V. Bird	216 gallons paste, Bureaus of Department	54 00
3	George Bogus	Fuel, Pension Office	160 67
3	do	Fuel, Department	382 98
3	Michael Neil	Shoeing horses, 40 shoes	15 00
3	W. B. Moses & Sons	814 yards Brussels carpet	1,031 02
3	do	Office furniture	130 05
3	A. S. Allen	18½ gallons paste, Land Office	4 63
5	Middleton & Lingenfelter	Making and repairs to furniture	264 50
5	Wyckoff, Seamans & Benedict	2 type-writers and repairs	234 35
5	Houghton, Mifflin & Co	1 thermometer	1 00
5	W. O. Berry & Co	2 large stoves and fixtures, blowers, grates, &c	76 00
5	W. R. Riley	8⅓ yards blue desk cloth	23 38
6	George Ryneal, jr	Paints, oils, varnish, glass, &c	34 25
6	Charles Fisher	1 thermometer	1 00
6	Washington Gas Light Company.	Gas consumed in Department buildings for October.	537 30

Expenditures on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1883.			
Nov. 7	J. W. Conrad	1 copy, 5 volumes, History of Pennsylvania, Pension Office.	$25 00
7	E. W. Woodruff	760 file-boxes	445 65
8	E. J. Hayward	Washing 9,572 towels, October, for 6 Bureaus	62 22
8	W. F. Lutz	Repairing caligraph, Land Office	17 50
8	P. A. Collins	Medical treatment, 3 horses	1 00
8	Bureau Engraving and Printing.	Engraving and printing 18,952 pension certificates.	701 22
9	Samuel G. Eberly	506 street-car tickets for Secretary's office	20 00
9	Robert Boyd	Hardware	101 96
9	W. F. Lutz	Hand stamps and repairs to stamps	24 30
9	George W. Knox	Moving machinery	5 00
9	Adams Express Company	Expressage, October, Secretary's Office	6 10
9	....do	Expressage, October, Land Office	5 00
9	....do	Expressage, October, Education Office	6 65
9	....do	Expressage, October, Railroad office	1 10
9	....do	....do	25
9	William Ballantyne & Son	5 hektographs refilled, brushes, &c	28 74
9	E. E. Jackson & Co	8 walnut pointer ends	16 00
10	John H. Pray, Sons & Co	99⅓ yards linoleum	69 53
10	J. G. Weaver & Sons	Laying old carpets, repairs to furniture, &c	67 87
10	A. G. Gedney	1 automatic numbering machine	45 00
10	Middleton & Lingenfelter	Making cases, screens, repairs to furniture	349 50
10	T. Somerville & Sons	Plumbing, gas-fitting, brass furnishing, &c	30 93
12	Conrad Becker	Harness repairs	9 25
12	F. M. Trevoe	1 dozen record ribbon	9 00
12	Adams Express Company	Expressage, Patent Office	1 15
12	....do	Expressage, Pension Office	60
12	Baltimore and Ohio Express Company	Expressage, Secretary's office	1 00
13	D. W. Dickson	Whitewashing Pension buildings, Twelfth street and Pennsylvania avenue and Thirteenth street and Pennsylvania avenue.	88 00
14	Bureau Engraving and Printing.	Engraving and Printing, 20948	775 08
14	A. P. McElroy	1 25 by 30 black and gilt frame	6 00
15	Middleton & Lingenfelter	Making and repairing furniture	285 50
15	Adams Express Company	Expressage, July, railroad office	1 10
16	Capt. W. H. Gill, military storekeeper.	4 United States post flags	50 40
16	....do	3 United States post flags	37 80
17	John L. Ginck	Subscription to Law Reporter, one year	3 00
17	Western Union Telegraph Company.	Telegraphing, October, Pension Office	27 60
17	....do	Telegraphing, October, Land Office	84 57
17	....do	Telegraphing, October, Secretary's Office	26 76
17	....do	Telegraphing, October, Railroad Office	2 16
17	....do	....do	80
19	Samuel G. Eberly	506 street-car tickets, Department	20 00
19	Eimer & Amend	Chemicals and chemical apparatus	383 23
19	Middleton & Lingenfelter	6 single black walnut desks, Land Office	180 00
20	Washington Post	Advertising proposals for fuel	5 23
20	A. H. Chace & Bro	Cleaning carpets for five Bureaus	32 76
20	Alex. Davidson	Repairs to carriage	32 75
21	W. F. Lutz	1 numbering stamp, repairs to stamp	36 25
21	John C. Parker	4 directories of different cities, 1 stylographic pen.	32 00
21	Joseph Rakeman	Painting rooms in buildings 803 G street and Twelfth street and Pennsylvania avenue.	87 50
22	Great Falls Ice Company	63,665 pounds ice for Bureaus of Department	254 66
22	Middleton & Lingenfelter	Making and repairs to furniture	201 00
23	Wash. B. Williams	New furniture, making and laying carpets	146 50
23	S. G. Eberly	506 street-car tickets, Department	20 00
23	Railway Agency Publishing Company.	Subscription, one year	4 00
23	National Railroad Publishing Company.	....do	4 00
23	Railroad Gazette	....do	4 20
23	Railway Review	....do	4 00
23	H. V. & H. W. Poor	1 copy Railroad Manual, one year	5 00
24	J. G. Weaver & Sons	Repairs to furniture, relaying carpets, &c	50 88
24	George M. Williams	48 folio castings for Patent Office	12 00
24	J. M. Wheatley	Fuel for building Thirteenth street and Pennsylvania avenue.	311 88
26	J. S. Topham	1 16-inch mail bag, name, plate, and marking	10 00
27	John Stevens	500 book-boxes	15 00
27	H. L. Lipman	9 sets riveters and punches, and other fixtures	14 87
27	D. Van Nostrand	1 copy Boilleams Travers Tables, Land Office	5 00
28	Houghton, Mifflin & Co	1 Postal Guide, January, 1883	50
28	E. H. King	1 case for maps	135 00

Expenditnres on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1883.			
Nov. 28	E. W. Woodruff	28 file-boxes; 4 do., extra size	$17 41
28	Baltimore and Ohio Express Company.	Expressage, Secretary's office	55
28	A. S. Allen	18½ gallons paste, Land Office	4 63
30	Chesapeake and Potomac Telphone Company.	Exchange rental, 22 divisions, July 1 to September 30.	330 00
30	Middleton & Lingenfelter	Making and repairs to furniture	227 50
30	Charles Fischer	6 magnifying glasses, 4-inch diameter, silver frames.	15 00
30	W. F. Lutz	Rubber stamps, dies, baths, repairs, &c	33 95
Dec. 1	W. O. Berry & Co	Stoves, grates, fixtures, and repairs to stoves, &c.	135 90
1	James E. Hoy, U. S. N	Material and erecting 5 flag-poles on buildings	63 68
1	E. F. Brooks	Gas-fixtures and furnishings	194 80
1	Michael Neil	Shoeing horses, 26 shoes	9 75
1	Chesapeake and Potomac Telphone Company.	Exchange rental, 25 divisions, Pension Office, July 1 to September 30.	375 00
1	George Motts	Harness and repairs to same	81 40
1	Wheatley Brothers	Dressed lumber	95 50
1	Charles Chase	Boarding 1 horse, November	25 00
1	H. J. Hart	1 dozen roach exterminators	3 00
1	Samuel G. Eberly	606 street-car tickets (Pennsylvania, 506; and railroad) 100, office	23 95
1	Samuel West	Carting 34 loads ashes from Pension Office	11 90
3	F. M. Trevoe	2 dozen Underwood's blank copying ribbon for type-writer.	26 00
3	Wyckoff, Seamans & Benedict.	1 type-writer complete, repairs to type-writers	115 60
3	R. Beall	3 copying-presses complete, 6 Little's book-holders, &c.	90 85
3	S. V. Bird	203 gallons paste for four Bureaus	50 75
3	L. G. Thompson	Board 3 horses, November	67 50
4	Middleton & Lingenfelter	Making 8 cases for files, Land Office	614 79
4	Joseph Bushman	7 days' professional service to Pension Office, horse.	20 00
4	J. M. Welty	1 copy roster of Wisconsin Volunteers	1 35
4	J. Lanahan	13 horseshoes and repairs to carriage	8 75
4	Baltimore and Ohio Express Company.	Expressage, Secretary's office	65
5	J. G. Weaver & Son	Resetting cases and relaying carpets	24 03
6	Thomas Somerville & Son	Iron and brass castings, fittings, &c	43 40
6	J. H. Pray, Son & Co	204 yards linoleum	142 80
6	Middleton & Lingenfelter	3 black walnut office desks	115 00
6	R. C. Hewitt	Forage furnished in November	98 23
6	Washington Gas Light Company.	Gas consumed in November by Department buildings.	661 05
6	Lee Crandall	Advertising proposals for fuel	1 65
7	Norris Peters	Engraving and printing 8,000 copies dotted blank T. plats.	320 00
7	W. B. Moses & Son	Brussels carpets	971 56
7	Baltimore and Ohio Express Company.	Expressage for Secretary's office	70
7	Henry Ulke	1 crayon portrait of Secretary Interior	100 00
8	Middleton & Lingenfelter	New furniture and repairs to old	240 50
8	Paret & Whittington	1 pneumatic copy-press, and law books	20 60
10	Samuel G. Eberly	506 street car tickets for Indian Office	20 00
11	Henry Roesser & Son	3 full file cases, 21 file sections	487 50
11	E. J. Hayward	Washing 8,643 towels for 6 Bureaus	56 18
12	Middleton & Lingenfelter	Altering book-cases, 3 black walnut desks	195 50
12	Robert Boyd	Hardware	80 23
13	Charles Fischer	3 thermometers	5 50
13	Woodward & Lothrop	20 yards toweling	2 80
13	Adams Express Company	Expressage for Secretary's office	1 55
14	do	Expressage for Education Office	4 80
14	Royce & Mareau	Repairs to electric bells and electrical supplies	44 33
14	Bureau of Engraving and Printing.	Engraving and printing 13,840 Pension certificates.	512 08
14	E. W. Woodruff	116 file-holders or boxes	66 25
14	Samuel G. Eberly	506 street car tickets for Department	20 00
14	Great Falls Ice Company	56,934 pounds ice during November for Department and Bureaus.	227 73
15	Middleton & Lingenfelter	2 black walnut desks and 1 fire-screen	145 00
15	O. P. G. Clark	Railroad fare and expenses to Toledo and return.	59 75
15	Singleton & Hoeke	1,094 yards jointless matting	492 30
19	W. F. Lutz	Rubber stamps, ribbons, and repairs to stamps	25 25
19	Keuffel & Esser	1 curve and railroad pen	5 00
19	E. W. Woodruff	80 file-boxes, plain	52 26
20	T. B. Hood	Railroad fare and expenses to Toledo and return.	60 36

Expenditures on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1883.			
Dec. 20	Eli Rathbone	Cash paid for rent of rooms 7 days at Shelbyville.	$20 00
20	Charles Fischer	1 thermometer	2 50
21	N. F. Metzger & Bro	20 boxes, 1⅔ dozen, wax tapers	1 65
22	Joseph Monsly	1 set, 4 volumes, Bates' History Pennsylvania for Pension Office	30 00
22	Gardner & Co	14 seats of birch and walnut, bent	14 16
22	E. A. Jacobs	4 window shades	12 50
22	Middleton & Lingenfelter	Making and repairs to furniture	206 25
26	J. G. Bates	Winding and regulation of clocks in six Bureaus for one quarter.	76 82
27	George Ryneal, jr	Paints, oils, glass, and brushes	39 41
27	John McDermott & Bro	Repairs to carriage	8 15
28	Western Union Telegraph Company.	Telegraphing for November, Secretary's office	29 43
28	do	Telegraphing for November, Education Office	1 15
28	do	Telegraphing for November, Land Office	50 56
28	do	Telegraphing for November, Pension Office	30 16
29	George Motts	New harness and repairs to old	148 65
29	George Bing & Co	New type and new type-holders	24 00
28	Middleton & Lingenfelter	1 fine black walnut desk, with pigeon-hole cases, Pension Office.	175 00
29	do	7 pigeon-hole cases, new desks, repairs to furniture.	367 65
29	F. A. Butts	1 copy record New York Volunteers, for Pension Office.	2 50
29	Adams Express Company	Expressage General Land Office	13 66
29	Samuel West	Carting 33 loads ashes from Pension Office buildings.	11 55
31	M. McDonough	Board of Indian Office horse, December	25 00
31	E. F. Brooks	Chandeliers and attachments	56 30
1884.			
Jan. 2	A. S. Allen	22½ gallons paste for Land and Indian Offices	5 63
2	John Keyworth	Candles, salt sacks, &c	17 70
2	H. Hollander	Wash-towls, slop-jars, ice-pitchers, water-coolers &c.	33 03
2	Holmes & Thompson	Livery of 3 horses, Pension Office, for December	67 50
2	W. O. Berry	New heating stoves, fixtures, and repairs	85 25
2	J. Lanahan	Shoeing horses, 25 shoes, &c	14 25
2	T. V. Bird	200½ gallons paste for four divisions	50 13
3	Wheatley & Bro	Dressed lumber	59 00
4	Robert Beall	5 copying-presses and stands	74 00
4	Michael Neil	Shoeing horses, 58 shoes and removes	24 25
4	H. O. Towles	6 cane-seat chairs, iron bedstead and mattress, stable.	31 50
4	Baltimore and Ohio Telegraph Company.	Telegrapling, July, Pension Office	1 25
4	do	Telegraphing, July, Patent Office	15
4	Royce & Mareau	Repairing electric bells and electrical supplies	32 75
4	do	do	33 00
4	George Bogus	Fuel for several Bureaus	256 66
4	do	do	252 79
4	E. G. Wheeler	Hardware	38 14
5	W. F. Lutz	Rubber stamps, hand-stamps, and repairs	79 00
5	J. M. Wheatley	Fuel for Pension Office	369 80
5	do	Fuel for Land Office	12 28
5	W. H. Porter & Co	Repairing caligraph	4 00
5	Middleton & Lingenfelter	5 single and 1 double desks and 4 walnut cases	415 00
7	L. R. Trembly	1 sign and frame	3 50
7	William Brakhagen	Repairing mail-bag	2 35
7	R. C. M. Burton	1 large awning cover for Pension Office	3 50
7	Washington Gas Light Company.	Gas furnished buildings of Department, December.	710 10
7	Charles E. Birckhead	Making portfolio drawers, &c	91 60
8	Great Falls Ice Company	53,690 pounds of ice for Department and Bureau, for December.	214 76
8	E. J. Hayward	8 946 towels washed during December for six Bureaus.	58 15
8	W. H. Morrison	Copp's Land Laws, Webster's Dictionaries, Lee's Tables, &c.	64 00
8	R. K. Helphenstine	144 chamois-skins, chemicals, &c	108 96
8	Charles Fischer	1 magnifying glass, repairs to stereoscope	3 50
9	Robert Boyd	Hardware	32 60
9	W. B. Moses & Son	New furniture, Brussels carpets, &c	481 64
9	do	New matting, new furniture	227 85
9	Chesapeake and Potomac Telephone Company.	Exchange rental, 1 quarter, 22 telephones	330 00
9	do	Exchange rental, 1 quarter, 25 telephones, Pension Office.	375 00
10	S. G. Eberly	125 street-car tickets	4 94

Expenditures on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1884.			
Jan. 10	Middleton & Lingenfelter.....	New desks, repairs to furniture, cases, &c	$305 75
10	George Ryneal, jr.	Paints, oils, glass, brushes, &c.....	27 20
11	Thomas Somerville & Son	Iron and brass castings, fixtures, &c	42 40
12	J. M. Wheatley.....	Fuel for Department.....	30 70
12	J. G. Weaver & Son	Relaying carpets.....	6 30
12	W. S. Hoge.....	Forage for horses, 4 months	92 62
12	Middleton & Lingenfelter ...	New desks and cases and repairs to furniture...	175 58
12	W. F. Lutz.....	Self inking stamp, material and repairs to stamps.	26 40
12	William Ballantyne & Son ...	Letter press and stand, hektographs and repairs.	46 83
12	Wash. B. Williams	1 lounge in leather, 2 walnut Continental S. and S. chairs.	79 42
12	.....do	New furniture, sewing and laying carpets, &c..	132 28
12	John McDermott & Bro	Repairs to wagon	18 25
14	E. W. Woodruff	200 file-boxes	112 00
15	D. Ballant	Repairs to eyelet-machine and 6 cutters.....	5 00
15	Samuel West	Carting 27 loads of ashes from Pension Office....	9 45
17	Samuel G. Eberly	506 street-car tickets	20 00
17	C. H. Burgess	Fuel	25 50
18	W. H. Boyd	42 copies City Directory	210 00
19	A. H. Chace & Bro	Cleaning carpets for Department and Bureaus..	67 44
19	E. L. Lambie	6 Van Laer binders, Patent Office	8 10
19	E. W. Woodruff	80 file-boxes, reshelving 2 cases	54 00
19	Scheller & Stevens.....	5 dozen toilet combs	3 25
19	J. H. Pray, Son & Co	100⅓ yards linoleum.....	70 23
19	French & Choate	6 pamphlet cases	2 40
19	Middleton & Lingenfelter ...	5 large storm windows, new cases, and repairs to furniture.	334 75
19	Bureau Engraving and Printing.	Printingand engraving 8,476 Pension certificates	314 35
21	J. M. Wheatley	Fuel for Department building.....	30 70
21	George C. Maynard.....	Repairing electrical bells.....	9 65
23	Adams Express Cmpany.....	Expressage, December, Education Office..	1 20
23	.....do	Expressage, December, Indian Office	2 75
23	E. H. King	Making new desks, &c., repairs to furniture....	204 00
24	Adams Express Compny.....	Expressage for the Pension Office, December...	35
24	.....do	Expressage for the General Land Office, December.	9 15
28	William H. Boyd.....	2 copies Boyd's City Directory	10 00
29	George Bogus	Fuel for the Pension Office	62 83
29	E. W. Woodruff	78 file-holders	48 23
30	Louis Schmid Sons	50 Red-Book boxes	25 00
30	Middleton & Lingenfelter	Repairs to furniture	177 75
30	P. Thomas	1 dozen balls brass polish	1 00
30	H. N. Copp	11 numbers of Copp's Land Owner.....	1 65
31	L. H. Schneider & Son	Hardware.....	17 48
31	M. McDonough.....	Care and keeping horses, in January.....	25 00
31	E. G. Saltman.	1 roll Par Excellence drawing paper.....	8 80
31	Wheatley Brothers.....	Shelving and partition lumber	92 10
31	Charles E. Birckhead	1 case containing 6 portfolios	43 02
31	A. S. Allen	27 gallons paste for Land and Indian Offices	6 75
31	Holmes & Thompson	Livery of 3 horses for January.....	67 50
31	M. J. Wine	2 walnut file-cases	112 70
Feb. 1	W. O. Berry & Co	New stoves and fixtures, repairs to old stoves, &c.	147 00
1	Samuel West	Hauling 25 loads ashes from Pension Offices	8 75
1	J. M. Wheatley.....	Fuel for Pension Office	374 02
1	Bankers and Merchants' Telegraph Company.	One message for Patent Office.....	15
1	do	Two messages for Secretary's office	30
1	R. C. M. Burton	Repairing flag on Education building.....	1 50
2	J. G. Weaver & Son.....	Sewing and laying old carpets	6 40
2	W. F. Lutz	Rubber stamps, repairs to type-writers, &c. ..	67 15
2	Robert E. Boyd	Repairs to electric bells.....	6 50
2	S. V. Bird	198 gallons paste for Patent and Secretary's Offices.	49 63
2	James S. Topham	1 pair saddle-bags.....	8 00
2	Middleton & Lingenfelter	Making desks and cases, and repairs to furniture.	493 25
2	George Motts.....	Repairs, harness	48 90
2	Michael Neil.....	24 horseshoes and 19 removes, and mending furnace rake.	27 25
2	J. Lanahan	34 horseshoes and 56 removes	22 25
4	J. B. Adams	1 Boyd's City Directory....	5 00
4	R. C. Hewitt	Horse-feed, January	96 76
4	S. G. Eberly	506 street-car tickets	20 00
5	Woodward & Lothrop.....	61½ yards cotton, New York Mills.....	15 38
6	Robert Beall	4 letter-copy presses and Webster's Dictionary..	72 00
6	Washington Gas Light Company.	559,300 feet gas consumed in January in all buildings of Department.	838 95

Expenditures on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1884.			
Feb. 6	Wash. B. Williams	13 walnut Continental S. and S. chairs	$61 23
6	Baltimore and Ohio Express Company.	Expressage in January, Secretary's office	14 50
6	E. J. Hayward	Washing 8,774 towels for Department and Bureaus in January.	57 03
7	James Hughes	Repairing plaster work, 2d and 3d floors of building Thirteenth street and Pennsylvania avenue.	43 00
7	George Ryneal, jr	Glass, paints, oils, varnish, &c	46 10
7	Robert Boyd	Hardware and 1 platform scale	114 72
7	John L. Ginck	Volume 2 Mackey's Reports	6 50
7	George Bogus	Fuel for Bureaus	204 64
7	Wyckoff, Seaman & Benedict.	1 copy-ribbon	1 00
7	....do	2 copy-holders	4 00
8	C. H. Burgess	Fuel for Education Office	121 93
8	George Bogus	....do	64 80
8	E. E. Jackson & Co	24 feet of walnut for screens	6 75
8	Baltimore and Ohio Express	Expressage on box from Philadelphia	40
8	Western Union Telegraph Company.	Telegraphing for Land Office for December	70 26
8	....do	Telegraphing for Pension Office for December.	32 94
8	....do	Telegraphing for Secretary's office for December.	26 86
8	....do	Telegraphing for Education Office for December.	4 61
8	Adams Express Company	Expressage for Secretary's office, January	1 85
8	....do	....do	1 60
8	E. W. Woodruff	226 file-holders	127 52
9	Thomas Somerville & Son	Plumbing material	9 42
9	Houghton, Mifflen & Co	100 Postal Guides	105 00
9	W. F. Lutz	1 numbering stamp and 1 dating stamp	59 00
9	Adams Express Company	Expressage in January for Pension Office	2 25
9	....do	Expressage in January for Education Office	20 30
9	R. M. C. Burton	Repairing 3 American flags	5 75
11	Royce & Marceau	Repairing, and new electric bells	29 75
11	Adams Express Company	Expressage for Railroad Office, November	60
11	....do	Expressage for Indian Office, January	2 70
11	....do	Expressage for Land Office, January	35 85
12	Middleton & Lingenfelter	New desks and book-cases and repairs to furniture.	226 00
12	Baltimore and Ohio Telegraph Company.	Telegraphing for Education Office for December.	3 23
12	....do	Telegraphing for Secretary's office July to December.	3 05
12	T. M. Wilcox	Reports of Secretary Interior, 1857, 1862, 1863, and 1866.	2 00
12	Great Falls Ice Company	22,825 pounds of ice for Department and Bureaus for January.	211 70
13	T. P. Little	1 reader's ready-rest, style B	4 50
14	E. Morrison	600 pasteboard cylinders, assorted sizes	77 00
14	....do	160 paper rolls, assorted sizes	7 20
14	Samuel G. Eberly	506 street-car tickets	20 00
14	John L. Ginck	1 copy Mackey's reports	6 50
14	Paret & Whittington	1 Hubbard's letter-press and stand, 1 Webster's Dictionary.	33 50
14	Kellogg & Johnson	1,260 palm soap, 1,338 pounds soda, 17 pounds castile soap, &c.	75 73
14	John Stevens	500 book boxes	15 00
15	Charles Fischer	1 thermometer	1 50
15	....do	6 magnifying glasses	18 00
16	E. W. Woodruff	500 file-holders	280 00
16	Samuel G. Eberly	506 street-car tickets	20 00
16	Joseph Rakeman	Kalsomining 2 partition walls	7 00
16	Charles E. Birckhead	1 case of 14 drawers	22 50
18	Baltimore and Ohio Telegraph Company.	Telegraphing for Land Office	95
18	Adams Express Company	Expressage on package, Railroad Office	25
18	....do	....do	25
18	W. H. Porter & Co	1 caligraph, Patent Office	85 00
18	J. M. Wheatley	Fuel	24 56
18	A. H. Chace & Bro	16 trunks for special express, Pension Office	230 00
19	Francis & Loutrel	Kalsomining 2 partition walls	7 00
19	Samuel G. Eberly	100 street-car tickets	3 95
20	Bankers and Merchants' Telegraph Company.	1 telegraphic message, Land Office	15
20	....do	1 telegraphic message, Secretary's office	15
20	George Bogus	Fuel	47 26
20	....do	Fuel	24 73
21	Western Union Telegraph Company.	Telegraphing for Education Office, January	30
21	....do	Telegraphing for Railroad Office, December	2 32
21	....do	Telegraphing for Railroad Office, January	2 89
21	....do	Telegraphing for Patent Office, October	40

Expenditures on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1884.			
Feb. 21	Western Union Telegraph Company.	Telegraphing for Pension Office, January	$36 12
21	do	Telegraphing for Land Office, January	1 50
21	do	Telegraphing for Secretary's Office, January	11 37
21	John L. Ginck	1 Mackey's Rules of Practice	2 50
23	Middleton & Lingenfelter	Repairs to desks, cases, and furniture	76 25
23	Charles Fischer	3 thermometers	1 50
26	Johnson C. Parker	71 pocket maps, 4 dozen pocket inkstands, &c	115 20
26	C. E. Birckhead	1 drawing table	25 00
26	Kueffel & Esser	1 protractor, 447	9 00
27	E. W. Woodruff	2 black walnut cases, panel doors, and 96 file-holders.	120 00
27	do	192 poplar file-holders	103 05
27	Charles Fischer	2 magnifying glasses	5 50
27	H. Hollander	1 plated ice pitcher, 2 water-cooler stands, &c	47 90
27	W. H. Pierce	½ dozen letter openers	4 50
28	J. S. Topham	1 Russia satchel and 1 canvas mail-bag, disbursing Office.	19 00
28	G. D. Mills	1 set Bates' History, 5 volumes, Pension Office.	15 00
29	J. W. Sinclair	Repairs to fire rake and to elevator	5 25
29	Holmes & Thompson	Clipping gray horse, Pension Office	3 00
29	do	Livery of 3 horses for February, Pension Office.	67 50
29	M. McDonough	Livery of 1 horse for February, Indian Office	25 00
29	A. S. Allen	18½ gallons paste for Land and Indian Offices	4 63
39	Western Union Telegraph Company.	Telegraphing for Land Office for January	51 33
Mar. 1	Samuel West	Hauling 37 loads ashes from Pension Office	12 95
1	Michael Neil	36 horseshoes	12 00
1	S. V. Bird	165 gallons paste for Patent and Secretary's Offices.	41 25
1	John McDermott & Bro	Repairs to carriages	74 80
1	do	do	45 50
1	Wheatley Brothers	Select lumber	54 00
1	Middleton & Lingenfelter	New desks and cases and repairs to same	400 00
1	W. F. Lutz	18 S. I. dating-stamps and repairs to old stamps	128 25
3	W. O. Berry & Co	24 tin file-boxes, fire-place grate, and repairs	32 50
3	George Mott	Repairs to harness	8 75
4	R. E. Boyd	Removing 5 electric bells, Indian Office	2 75
4	J. Lanahan	6 horseshoes	3 00
4	Washington Gas Light Company.	527,700 feet gas consumed at all Department buildings in February.	791 10
5	George Ryneal, jr	Paints, oils, glass, varnish, &c	65 23
5	Louis Schmidt & Son	Wire-work frame over doors, &c	20 00
5	William Ballantyne & Son	Paper, &c., for hektographs	25 74
6	P. Green	Hauling freight from Department to depot	1 50
6	W. B. Moses & Son	Office furniture, carpets, &c	401 55
6	Wyckoff, Seaman & Benedict.	5 type-writers, ribbons, oil, &c	465 60
6	Samuel G. Eberly	506 street-car tickets	20 00
7	John Keyworth	76 pounds candles and 10 cakes sapolio	20 20
7	Great Falls Ice Company	37,510 pounds ice to Department and Bureaus in February.	190 04
7	John Wanamaker	2 clocks, Seth Thomas Regulators	19 50
8	Thomas Somerville & Son	Steam-heating material	5 90
8	Royce & Mareau	Repairs to electric batteries	5 00
10	E. J. Hayward	9,007 towels washed for Department and Bureaus for February.	58 54
10	R. H. Graham	Cutting tire	1 00
10	do	Repairing carriage cloth	2 00
10	Baltimore and Ohio Express Company.	Expressage on package	40
10	Baltimore and Ohio Telegraph Company.	Telegram	25
10	Baltimore and Ohio Express Company.	Expressage on 3 packages	2 45
11	do	Expressage on 1 package	25
11	Paul E. Williams	Rent of room, &c., at Knoxville for investigating committee, Pension Office.	82 50
12	W. H. Boyd	1 copy Boyd's City Directory	5 00
12	G. D. Mills	1 set Bates' History Pennsylvania (5 vols.), Pension Office.	15 00
12	C. H. Burgess	Fuel	437 60
12	Middleton & Lingenfelter	Making desks and cases and repairs to furniture	253 50
13	J. M. Wheatley	Fuel	385 97
13	Wash B. Williams	Sewing and laying 113⅜ yards carpet, 6 Continental S. and S. chairs.	34 64
13	Adams Express Company	Expressage from Saint Louis, Indian Office	25
13	do	Expressage, Land Office, for February	13 50

Expenditures on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1884.			
Feb. 13	E. W. Woodruff	1 dozen file-holders	$5 32
13	..... do	275 feet black walnut molding and 1 plain black walnut case.	25 00
13	Willett & Libbey	306 feet 4 by 4 section, dressed	13 77
13	James S. Topham	2 pair saddle-bags	16 00
13	Robert Boyd	Hardware	60 75
14	E. H. King	500 map sticks, 2 sets storm sash, &c	82 00
14	Adams Express Company	Expressage for the Pension Office	1 85
14	George Bogus	Fuel	141 58
14	do	Fuel	6 48
15	W. F. Lutz	Rubber stamps and stamp material and repairs	33 80
15	N. T. Metzger & Brother	2 dozen boxes wax tapers	1 98
15	Adams Express Company	Expressage in February, Secretary's office	3 90
15	.....do	Expressage in February, Education Office	10 75
18	N. A. Adams	Railroad fare and expenses of self and clerk to Muscogee, Ind. T.	176 55
18	Houghton, Mifflin & Co	98 Postal Guides, January, 1884, and 30 supplementals, February and June.	56 50
18	H. A. Copp	25 copies Settlers' Guide	6 25
19	T. Somerville & Son	Repairing steam coils	26 85
20	James E. Brophy	1 Smith's Noiseless Stamp and font type	18 00
21	Samuel G. Eberly	125 street-car tickets for Railroad Office and 506 for Indian Office.	24 94
21	R. K. Helphenstine	5 dozen toilet soap, 6 pounds chloride of lime	39 65
22	James S. Topham	1 mail valise, Pension Office	12 00
22	J. W. Sinclair	Repairs to fire hoe and rake, 1 brass stuffing box	7 00
22	L. B. Middleton	24 tin file-holders	14 40
22	Samuel G. Eberly	506 street-car tickets, Pension Office	20 00
24	R. T. Wilson	7½ pounds Russian iron pipe, Pension Office	2 25
24	Bankers and Merchants' Telegraph Company.	1 telegraphic message	20
24	Baltimore and Ohio Telegraph Company.	Telegraphing in October for Education Office	45
25	S. G. Eberly	506 street-car tickets, Education Office	20 00
25	Wyckoff, Seaman & Benedict	Repairs to type-writers, oils, ribbons, &c	50 15
25	Charles Fischer	1 magnifying glass, Patent Office	2 75
25	N. W. Burchell	Candles, roach powder, and 2 bellows	3 22
27	Western Union Telegraph Company.	Telegraphing for Railroad Office, February	4 30
Mar. 27	.....do	Telegraphing in February, Land Office	67 01
27	.....do	Telegraphing in February, Pension Office	27 69
29	.....do	Telegraphing in February, Secretary's Office	20 36
29	Middleton & Lingenfelter	Making new desks and drawing boards	160 00
29	E. P. Brooks	Gas fixtures and repairs	98 41
31	A. S. Allen	21 gallons paste for Indian and Land Offices	5 25
April 1	Samuel West	Hauling 41 loads ashes from Pension Office	14 35
1	M. McDonough	Livery of horse, Indian Office, month	25 00
2	George Motts	New harness and repairs to old	36 35
2	John Stevens	500 book boxes	15 00
2	S. V. Bird	178 gallons paste for Patent and Secretary's Offices.	44 50
3	Holmes & Thompson	Livery of 3 horses, 1 month, Pension Office	67 50
4	J. Lanahan	10 horseshoes and 6 removes	7 25
4	E. J. Hayward	10,735 towels washed during March for Department and Bureaus.	69 78
5	J. G. Bates	Winding and keeping in order 135 clocks, first quarter, 1884.	77 98
5	Michael Neil	34 horse shoes and 10 removes	15 25
7	Samuel G. Eberly	506 street-car tickets	20 00
7	James G. Bates	Cleaning and repairing 1 calender clock, chief clerk's room, Pension Office.	3 00
8	L. B. Middleton	Repairing furniture and cases	73 75
9	W. F. Lutz	New rubber dating-stamps and repairs to old	33 75
10	Robert Boyd	Hardware	78 95
10	L. Schmidt & Son	100 Red Rook boxes	50 00
10	W. H. Dempsey	2 Morton pens	4 00
10	William Ballantyne & Son	Hectographs, refilling, paper, &c	26 37
10	R. C. Hewitt	Horse-feed, 1 month	96 76
10	H. Roesser & Son	20 file-case sections	300 00
10	W. H. Boyd	1 Boyd's District map	3 00
10	E. W. Woodruff	315 file-holders, walnut fronts	192 94
10	.....do	5 cases, capacity each of 63 holders, General Land Office.	70 00
10	Wheatley Brothers	Shelving and case lumber	29 10
10	Adams Express Company	Expressage in March, Education Office	4 35
10	Baltimore and Ohio Express Company.	Expressage, 1 box, from Baltimore, Md	40
10	.....do	Expressage, 1 package, from Philadelphia.	30
10	Robert Beall	3 letter-copying presses, 1 S. year-book	51 00
10	Washington Gas Light Company.	479,400 feet of gas consumed in March, Department and offices.	719 10

Expenditures on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1884.			
April 10	Royce & Mareau	New electric bells and repairs to old	$27 75
11	T. Somerville & Sons	1 1½-inch run thread	90
11	Western Union Telegraph Company.	Telegraphing in March, Secretary's Office	27 50
11	....do	Telegraphing in March, Land Office	47 96
11	....do	Telegraphing in March, Pension Office	58 60
11	....do	Telegraphing in March, railroad office	1 00
11	Adams Express Company	Expressage in March, Land Office	7 50
11	....do	Expressage in March, Patent Office	1 40
11	....do	Expressage in March, Indian Office	1 10
11	W. S. Hoge	Forage furnished in first quarter, 1884	71 83
11	W. H. Dennis	1 copy probate law	3 00
12	M T. Metzger & Bro	2 dozen scrubbing-brushes, Pension Office	2 66
12	Great Falls Ice Company	51,025 pounds ice in March, Department and Bureaus.	204 10
12	J. G. Weaver & Son	Sewing and laying 64 yards carpet	3 67
12	E. H. King	1 walnut desk, 1 tray for inkstand	20 00
12	George Ryneal, jr	Paints, oils, varnish, brushes, &c	47 29
12	M. J. Wine	1 walnut file-case, for 72 files	105 00
14	R. G. Hutchinson	12 strap-files, assorted, and lettering 12 files	16 50
14	R. C. M. Burton	Repairing 3 American flags	5 00
15	Baltimore and Ohio Telegraph Company.	Telegraphing in March, Secretary's Office	70
15	C. H. Burgess	Fuel	291 33
15	Adams Express Company	Expressage for railroad office	25
15	....do	Expressage for Secretary's Office	2 10
15	Wimsatt & Uhler	2,000 pieces white pine	60 00
17	Baltimore and Ohio Telegraph Company.	1 telegram, Education Office	15
18	George Bogus	Fuel	6 48
18	....do	Fuel	213 99
18	....do	Fuel	105 44
18	Charles Fisher	1 magnifying glass	2 00
19	L. B. Middleton	Making and repairing file-cases and repairs to furniture.	227 25
19	Baltimore and Ohio Telegraph Company.	2 telegrams for Patent Office	45
21	W. F. Lutz	Rubber stamps and dies and repairs to old	23 55
22	E. G. Wheeler	Hardware	12 17
22	John S. Rich	1 copy Quain's Dictionary of Medicine, Pension Office.	8 00
23	Eagle Lock Company	9 dozen key blanks	1 44
24	G. A. Whittaker	1 Baumgarten stamp, Pension Office	15 00
25	Woodward & Lothrop	105 yards cotton sheeting, 25 yards cotton, &c	29 56
25	Joseph Rakeman	Pointing up and kalsomining 508 Eleventh street, Pension Office.	8 00
25	J. S. Topham	1 pair saddle-bags, Pension Office	8 00
26	J. M. Wheatley	Fuel	310 23
26	John H. Gheen	Use of carriage for Assistant Secretary, 4 days	8 00
26	J. C. Parker	1 legal case, 2 revolving book-cases, dictionary and table, &c.	91 20
26	James Lingenfelter	3 walnut desks, pigeon-hole cases	24 00
20	George W. Williams	6 patent combination desk locks	12 00
20	C. Becker	500 No. 58-inch straps	50 00
29	James Lingenfelter	1 single black walnut desk, Pension Office	30 00
29	Central News Company	6 chronicles of the great rebellion	6 00
29	Keuffel & Esser	Mathematical instruments	47 60
29	Chesapeake and Potomac TelephoneCompany.	Exchange rental of 22 telephones, December 31–March 31.	345 84
29	....do	Exchange rental of 26 telephones, Pension Office, first quarter, 1884.	375 00
29	National Electric Company	1 portable electric igniter, 15-inch, nickel plate, Secretary's office.	6 00
29	Woodward & Lothrop	2½ yards cotton cioth	45
30	M. McDonough	Livery of 1 horse for April, Indian Office	25 00
30	Paret & Whittington	4 Little's book rests	18 00
30	Holmes & Thompson	Livery of 3 horses for April, Pension Office	67 50
May 1	A. S. Allen	20½ gallons paste for Land, Patent, and Indian Offices.	5 13
1	Wyckoff, Seaman & Benedict	2 No. 2 type-writers, repairs to old writers, &c	214 50
1	....do	2 No. 2 type-writers and repairs to one	183 70
1	S. G. Eberly	506 horse-car tickets, Secretary's office	20 00
1	Samuel West	Hauling 41 loads of ashes from Pension Office	14 35
1	Wash. B. Williams	18 continental walnut S. S. chairs	84 78
1	J. W. Drew	11 dozen toilet soap, 1 feather duster, 3 nail-brushes.	25 25
1	Wheatley Brothers	200 feet select poplar, dressed	9 00
1	Michael Neil	36 horse shoes	13 50
2	S. V. Bird	175½ gallons paste for Secretary's and Patent Office.	43 87

Expenditures on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1884.			
May 2	N. T. Metzger & Bro	3 dozen scrue brushes	$3 99
2	W. O. Berry & Co	Repairs to grates, new slabs, bricks, &c	15 50
3	J. Lanahan	16 horse shoes	8 00
3	Royce & Mareau	Removing and repairs to electric batteries	13 00
3	J. G. Weaver & Son	1 pine case, stained	4 59
3	George Motts	Harness and repairs to same	12 65
3	Washington Gas Light Company.	557,900 feet gas consumed in April by Department and Bureaus.	688 35
3	E. H. King	1,000 map sticks, 12 rollers, 2 drawing boards	89 76
3	Joseph Rakeman	Kalsomining ceilings of 12 rooms, Pension Office, Twelfth street.	45 00
3	E. J. Hayward	Washing 9,516 towels for April for Department and Bureaus.	61 85
3	E. W. Woodruff	50 file-holders, walnut fronts, Pension Office	30 62
5	Baltimore and Ohio Exprees Company.	Expressage on 1 package from Saint Louis	70
5	Keuffel & Esser	Mathematical instruments	5 90
6	William Ballantyne & Son	8 hectographs	21 37
6	Baltimore and Ohio Express	Expressage, 1 package, from New York	65
6	do	Expressage, 1 package, from New York	25
6	A. Davidson	Repairs to Indian Office carriage	2 50
6	C. E. Birckhead	2 black walnut desks, Pension Office	60 00
6	W. B. Moses & Son	Furniture, window-shades, matting, &c.	338 88
6	Samuel G. Eberly	125 street-car tickets	4 94
7	L. B. Middleton	Repairing furniture, cases, &c	34 25
7	Adams Express Company	Expressage for Secretary's Office, April	1 60
7	Robert Boyd	Hardware	86 93
8	James B. Lambie	40 pair nickel-plated hinges	44 00
8	W. F. Lutz	Rubber stamps and dies and repairs to stamps	15 50
8	Adams Express Company	Expressage in April for Pension Office	6 65
9	Joseph Neumans	1 dozen bases to top ornaments of cluster of lamps, Secretary's office.	7 80
9	Adams Express Company	Expressage in April for Indian Office	3 65
10	Thomas Somerville & Sons	1 piece brass tube	60
10	Adams Express Company	Expressage in April, Land Office	4 95
10	do	Expressage in April, Patent Office	50
10	E. W. Woodruff	5 file holders walnut fronts	5 18
10	C. E. Birckhead	14 portfolios, Patent Office	89 88
12	Great Falls Ice Company	53,181 pounds of ice for Department and Bureaus for April.	212 72
12	Wyckoff, Seamans & Benedict	1 copy-holder, 2 ribbons, 1 lock-strap	5 50
12	Ely Gales	Cleaning flues in furnace, Pension building	5 00
13	E. W. Woodruff	1,010 feet walnut and poplar	42 05
13	Burr Index Company	1 Burr's Combination Index, No. 1207, Indian Office.	30 00
13	F. M. Thornett	1 Purdy pen	4 50
14	E. L. Brown	Cleaning, repairing, and adjusting type-writer, Indian Office.	2 50
14	Baltimore and Ohio Telegraph Company.	1 telegram for Education Office	25
14	do	1 telegram for Secretary's office	26
14	L. B. Middleton	12 window-shades, 1 double pigeon-hole case, 225 tin sheet weight proctectors.	52 50
16	G. W. Woolley	200 Woolley's patent premium reservoir attachments for pens.	50 00
16	R. H. Graham	Repairs to carriages and wagons	119 27
16	John Wannamaker	1 set Thomas' regulators	9 75
16	do	1 office table, 3 feet 6 inches by 2 feet 6 inches, cloth top.	7 75
16	do	8 office clocks and 25 dozen towels	144 75
16	L. Schmidt & Son	2 wire screens over door of stationery room	5 00
20	do	100 red boxes, special design, and 36 green boxes, paper size.	84 00
20	J. S. Topham	Repairing 6 trunks for special examiners, 2 pair saddle-bags.	25 00
20	George Ryneal, jr	Paints, oils, brushes, varnish, glass, putty, &c	21 65
21	Samuel G. Eberly	506 street-car tickets for Education Office	20 00
22	Baltimore and Ohio Express Company.	Expressage on 1 package from Baltimore	1 35
22	W. H. Verhoff	16 feet walnut and 15 feet gilt molding	3 65
23	W. F. Lutz	Repairs and material for rubber dating-stamps	20 00
24	C. E. Birckhead	1 portfolio, 8 extra flaps with quadrants, 4 plain drawers, Patent Office.	93 36
24	Smith Thompson	30 Thompson's safety file-holders, Land Office	18 75
24	James Morrison	Recaning chair, Patent Office	75
24	Willett & Libbey	2,723 feet 4 by 4 seconds, dressed	122 53
24	D. McLellan	1,000 sectional township blanks, General Land Office.	80 00
24	H. L. Pelouze & Son	Type for branch printing office	31 00
24	do	Type for branch printing office	13 00

Expenditures on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1884.			
May 26	Samuel G. Eberly	506 street-car tickets for Education Office	$20 00
27	L. Schmidt & Son	100 red boxes, Patent Office	50 00
28	H. Hollander	Cuspadors, ice pitchers, coolers, and stands, mops, &c.	70 57
28	J. C. Ringwalt	7 Rand and McNally's Business Atlas, &c., Pension Office.	87 50
28	E. W. Woodruff	1 walnut cabinet with drop-shelf, to hold 108 file-holders.	65 00
28	....do	9 dozen file-holders, walnut fronts, 7 by 4 by $10\frac{1}{4}$, Pension Office.	47 25
29	J. C. Parker	3 stylographic pens, 1 Saint Louis Directory, 12 boxes gum wafers.	15 50
29	George W. Williams	200 beveled lugs for portfolio drawers	50 00
31	John S. Rich	1 Quaim's Directory Medicine, Pension Office	8 00
31	L. B. Middleton	1 case shoe-drawers for Patent Office	31 25
31	C. E. Birckhead	2 single black walnut desks, Secretary's Office	60 00
31	....do	1 black walnut book-case, Indian Office	54 50
June 2	M. McDonough	Livery of horse, 1 month, Indian Office	25 00
2	Holmes & Thompson	Livery of three horses, 1 month, Pension Office	67 50
2	Samuel West	Hauling 29 loads ashes from Pension Office	10 15
3	S. V. Bird	175 gallons paste during May	43 75
3	E. G. Saltman	1 roll Hercules drawing paper, No. 269	10 00
3	Michael Neil	50 horseshoes for Department and Bureaus	18 75
3	George Motts	New harness and repairs to old	12 95
3	William Ballantyne & Son	12 letter and cap hectographs refilled	37 67
4	A. S. Allen	18 gallons paste for Land and Indian Bureaus	4 63
4	Wheatley Brothers	1,100 feet shelving and poplar lumber	39 50
4	J. J. Lanahan	17 horseshoes	8 50
4	L. H. Schneider & Son	Hardware	18 35
4	C. F. Sawyer	Railroad fare and expenses to Chicago and Detroit and return.	113 45
5	Kay & Brother	Volume 101, Pennsylvania State Reports, 1 Law Private Corporations, railroad office.	7 50
5	Washington Gas Light Company.	347,400 feet gas consumed by Department and Bureaus in May.	521 10
5	John Stevens	100 book boxes for Patent Office	30 00
6	E. J. Hayward	Washing 9,651 towels during May for Department and Bureaus.	62 73
6	Singleton & Hoeke	Matting furnished Department and Bureaus	1,049 10
6	J. C. Ringwalt	5 copies Rand and McNally's Atlas and Shippers Guide.	62 50
6	George Ryneal, jr	Paint, glass, and putty	24 36
6	C. E. Birckhead	1 pine case, painted and grained, Land Office	31 50
6	S. Wolf	Administering oath on 18 affidavits, account of investigations.	4 50
6	R. C. M. Burton	Repairing 3 American flags, Secretary's office	9 00
6	....do	Repairing 2 American flags, Pension Office	12 00
7	W. F. Lutz	25 lever date-stamps, 2 rubber dies, &c	202 80
7	J. G. Weaver & Son	Making 1 pine book-case	8 50
7	Western Union Telegraph Company.	Telegraphing in April for Secretary's office	7 40
7	....do	Telegraphing in April for Land Office	95 33
7	....do	Telegraphing in April for Pension Office	31 23
7	....do	Telegraphing in April for Railroad Office	40
7	....do	Telegraphing in March for Railroad Office	55
7	....do	Telegraphing in April for Education Office	1 45
9	R. H. Graham	Repairs to office wagon	7 25
9	Louis Schmidt & Son	$8\frac{1}{8}$ feet wire screen for Patent Office	3 27
9	Samuel West	Hauling 63 barrels sawdust, Land Office	15 75
9	Samuel G. Eberly	506 street-car tickets, Land Office	20 00
10	Philadelphia Bulletin	Advertising proposals for miscellaneous supplies.	13 20
10	Chesapeake and Potomac Telephone Company.	Exchange rental of 23 telephones, second quarter 1884.	354 67
10	....do	Exchange rental of 25 telephones, Pension Office, second quarter 1884.	375 00
10	Adams Express Company	Expressage in May for Secretary's office	4 85
10	Cad. Evans	$2\frac{7}{12}$ dozen patent gas-burners for Pension Office	15 50
10	Wash. B. Williams	2 walnut continental S. and S. chairs	9 42
10	M. J. Wine	1,000 file-holders, Patent Office	500 00
10	Louis Schmidt & Son	119 feet square wire guards and 4 wire transoms	61 95
11	George W. Knox	Freight and cartage for Education Office	3 20
11	Adams Express Company	Expressage for Indian Office in May	4 65
11	....do	Expressage for Education Office in May	1 00
11	....do	Expressage for Secretary's office in May	30
11	Robert Boyd	Hardware	69 66
11	R. C. Hewitt	Horse feed	96 76
11	Charles Fischer	6 heading glasses, oblong, and 1 magnifying glass.	17 00
11	Alex. Davidson	Repairs to carriage	46 50

Expenditures on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchsses, &c.	Amount.
1884.			
June 12	Adams Express Company.....	1 package from Boston, Patent Office.....	$0 60
12	.....do	Expressage in May for Railroad Office.....	1 00
12	.....do	Expressage in May for Pension Office	15 00
12	Sunday Herald.....	Advertising proposals for miscellaneous supplies.	7 00
12	..... do	Advertising proposals for ice.....	3 00
12	..... do	Advertising proposals for repairing clocks	3 00
12	.....do	Advertising proposals for washing towels.....	3 00
12	W. H. Veerhoff.....	16 feet walnut and 16 feet gilt molding.....	3 36
12	E. L. Lambie	2 binders, 14¼ by 9¼	3 48
13	Baltimore American	Advertising proposals for miscellaneous supplies.	8 93
13	Philadelphia North American.	..... do	12 60
13	Keuffel & Esser	1 steel triangle, 874–12.....	3 00
13	E. W. Woodruff	10 file-holders, walnut fronts, 6 by 4⅜ by 9	4 72
14	Great Falls Ice Company.....	55,332 pounds ice for Department and Bureaus for May.	221 33
14	W. H. Veerhoff	2 feet walnut and 2 feet gilt molding	44
14	E. H. King.....	1 walnut case for Patent Office and mounting 2 maps.	96 50
16	E. B. Laporte	1 walnut book-case with 7 trays for Patent Office.	50 00
16	C. E. Birckhead.....	15 portfolios, 3 plain drawers, 2 step-ladders, 1 desk screen.	137 80
16	M. G. Copeland & Co.....	4 10 by 20 feet ensigns, United States, 12	48 00
17	Baltimore and Ohio Express Company.	Expressage in May, Secretary's office	1 95
19	New York Herald	Advertising proposals for miscellaneous supplies.	27 00
19	E. W. Woodruff.....	125 walnut file-holders, 10 by 4⅝ by 11¼	97 86
19	Little, Brown & Co	1 Wait's Action and Defenses and index, vol. 6; 1 Wharton's Commentaries on American Law.	50 00
19	John S. Rich	3 Quaim's Dictionary Medicine.....	24 00
20	Boston Traveller..... ...	Advertising proposals for miscellaneous supplies.	9 17
21	E. B. Middleton	Varnishing and recovering desk and rep screen, Secretary's office.	14 50
21	C. Becker	500 file straps.....	50 00
23	Samuel G. Eberly	200 street-car tickets	7 90
24	W. F. Lutz.....	1 hand stamp, 1 rubber stamp, repairs to stamps.	9 65
24	John C. Parker	46 pocket maps, 3 dozen pocket inkstands, 1 card rack.	42 00
24	G. A. Whittaker	Repairing paragon pen for Assistant Attorney-General of Department.	50
24	.....do	12 Burlington files	6 00
24	C. E. Birckhead.....	1 drawing board, 1 single desk, laying floor in rooms 76 and 78.	125 00
25	George C. Maynard.....	Electrical supplies	13 75
26	Joseph Rakeman	Painting walls Seventh street wing, graining doors, bronzing bannisters, &c.	283 63
26	Stott, Cromwell & Co.....	1 bottle H. H. H. liniment for stables	1 00
26	H. Hollander.....	Ice pitcher, water cooler, cotton mops, &c	36 53
26	H. Jarboe	300 straps.....	10 50
27	James Lingenfelter.....	2 single B. W. desks, Patent Office	60 00
27	M. W. Beveridge.....	Willow, tin-ware, whisk brooms, wooden buckets, &c.	172 62
27	E. Morrison.....	33 map tubes, cloth covered, and capping tubes	16 27
27	Wheatley Bros.....	Flooring, partition and casing lumber	167 41
27	National Electric Company...	Disconnecting and connecting wires	1 50
27	R. K. Helphenstine.....	1 dozen type-cleaning brushes, 3 nail brushes, &c.	8 90
27	Cad. Evans	8 dozen patent saving gas-burners, Pension Office.	48 00
28	James A. Nelson.....	Sweeping 80 second, third, and fourth story flues.	40 80
28	Wyckoff, Seamans & Benedict.	1, 8 drawer cabinet, repairs to type-writers.....	37 25
28	John H. Gheen.....	16 days hire of horse for Patent Office	40 00
28	F. M. Trevoe.....	Repairing and cleaning calligraph.....	8 50
28	E. W. Woodruff.....	12 file-holders, walnut front, 11 by 4¾ by 10½.....	7 70
28	..... do	Altering shelving room 106, 100 feet $\frac{3}{16}$ poplar...	8 50
30	N. T. Metzger & Bro.....	12 boxes wax tapers	99
30	C. E. Birckhead	1 single desk for custodian	33 00
30	J. N. Sinclair.....	1 wrought stuffing box, dressing 3 chisels	2 55
July 1	M. McDonough	Livery of Indian Office horse for June	25 00
1	L. B. Middleton	New office desks, cases, and screens.....	133 00
1	Samuel West	Hauling 18 loads of ashes from Pension Office and 26 loads from Patent Office.	15 40
1	C. H. Burgess	Fuel	308 84
2	Singleton & Hoeke	Matting for Department and Bureau, per contract.	863 29
2	Robert Beall.....	4 Webster Dictionaries, 2 Post-Office Guides	43 00

Expenditures on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1884.			
July 2	W. O. Berry & Co	Repairing hames on harness	$0 50
2	Wash. B. Williams	Laying 75 yards carpet, and sewing and laying 199 yards carpet.	14 94
2	Willett & Libbey	3,000 feet seconds, dressed	135 00
2	Royce & Mareau	Furnishing and repairing electric bells	5 50
2	....do	....do	28 30
2	....do	....do	4 40
2	W. H. Morrison	1 Law of Married Women, Federal Reporters	40 00
2	L. H. Schneider & Son	1 blacksmith's stock and dies	10 25
2	Baltimore and Ohio Express Company.	Expressage on 1 bundle from Philadelphia	35
2	George Ryneal, jr	Paints, oils, glass, putty, varnish, and brushes	34 87
2	Wimsatt & Uhler	5,000 pieces board 9½ by 12½	150 00
2	W. B. Moses & Son	191¼ yards body brussels, taking diagonal, and cutting carpet.	242 06
2	....do	Miscellaneous office furniture	250 68
2	S. A. Lashear	Hauling 1,236 sacks of public documents during June.	37 08
2	J. F. W. Dorman	1 round pad for examiner's lamp, Patent Office	35
3	J. G. Bates	Winding and keeping in order 135 clocks, during 2d quarter 1884.	77 98
3	George W. Williams	12 combination locks for desks	24 00
3	Holmes & Thompson	Livery of 3 horses for Pension Office, June	67 50
3	Michael Neil	32 horseshoes, Department and Bureau horses	12 00
3	S. G. Eberly	506 street-car tickets	20 00
3	W. W. Tupper	8 No. 2 grates for Pension Office	45 32
3	S. N. Bird	150½ gallons paste, Secretary and Patent Office, June.	37 62
3	S. G. Eberly	253 street-car tickets for Education Office	10 00
3	W. D. Wyvill	Repairs to grate and stove	3 90
3	Robert Boyd	Hardware	191 87
3	W. S. Hoge	Forage for horses, April and May	71 99
3	W. F. Lutz	52 rubber stamps and pads, repairs to stamps, &c.	53 75
3	Smithsonian Institution	Transportation, 13,640 pounds (62 cases), to foreign countries.	682 00
3	George Motts	New harness and repairs to old harness	24 70
3	E. L. Lambie	2 binders, 14½ by 9½, "proposals," custodian's room.	3 48
3	Washington Gas Light Company.	276,900 feet gas consumed by Department and Bureaus for June.	415 35
3	John McDermott & Bro	Repairs to office carriages, Secretary's office	100 25
3	....do	1 mail wagon for Pension Office and repairs to Pension Office carriage.	186 35
3	Levy Curry	Black walnut railing, room 29, Patent Office, per drawing.	38 50
5	R. H. Graham	Repairs to office carriage, Land Office	2 40
5	Thomas Somerville & Son	Castings, galvanized pipe, fittings, &c	149 42
5	A. S. Allen	25 gallons paste for Land Office	6 25
5	F. H. Thomas & Co	Acts of Alabama, Mississippi, Nevada, and Oregon.	28 50
5	....do	Laws of the several States of the United States, 101 volumes.	356 50
5	Western Union Telegraph Company.	Telegraphing in June, Secretary's office	21 22
5	....do	Telegraphing in June, Pension Office	37 60
5	....do	Telegraphing in June, Land Office	80 81
5	....do	Telegraphing in May, Railroad Office	1 24
7	Baltimore and Ohio Express Company.	Expressage on 3 bundles, Secretary's office	1 60
7	H. N. Copp	7 copies Land Owner	1 05
7	....do	Subscription to 6 copies Land Owner	11 50
7	J. Lanahan	16 horseshoes for Department and Bureau horses.	8 00
8	Paul E. Williams	Rent of office for S. E. Board, at Macon, Mo., May 17 to June 10.	101 00
8	Ely Wheeler	Miscellaneous hardware	40 05
8	A. H. Chace & Bro	Cleaning 656 yards carpet for Indian Office	14 43
8	....do	Cleaning 538 yards carpet for Education Office	11 84
8	....do	Cleaning 2,681½ yards carpet for Land Office	58 99
8	....do	Cleaning 738 yards carpet for Patent Office	16 24
8	....do	Cleaning 6,509 yards carpet for Pension Office	143 20
8	Adams Express Company	Expressage for Secretary's office, June	5 55
9	Baltimore and Ohio Express Company.	....do	5 00
9	....do	Expressage for Land Office, June	1 10
9	Adams Express Company	Expressage for Pension Office, June	4 05
9	....do	Expressage for Indian Office, June	1 00
9	Washington Post	Advertising proposals for miscellaneous supplies.	18 00

Expenditures on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1884.			
July 9	Washington Post	Advertising proposals for winding clocks	$5 20
9	....do	Advertising proposals for washing towels	4 20
9	....do	Advertising proposals for waste paper	3 60
9	....do	Advertising proposals for ice	5 20
9	W. H. Dempsey	Repairing 1 Morton drawing pen No. 165	75
10	Charles Fischer	1 thermometer, 1 by 3 inch magnifying glass	3 00
10	..... do	1 magnifying glass, extra power	1 75
10	Great Falls Ice Company	72,660 pounds ice	290 64
10	George Bogus	1 cord pine wood	6 86
10	....do	Fuel	64 31
10	New York Tribune	1 year's subscription	12 00
11	James Lingenfelter	1 black walnut case for Education Office	45 00
11	Charles Fischer	1 parallel rule, Indian Office	5 00
11	Warner & Foote	1 copy of map of Dakota	15 00
11	Robert Beall	12 Mark Twain's scrap books, 1 Webster's Dictionary, 10 Postal Guides.	64 00
11	E. J. Hayward	Washing 10,247 towels for Department and Bureau for June.	66 61
11	William Ballantyne & Son	4 letters No. 2 hectograph refilled	6 64
11	..... do	Refilling letter No. 2 hectographs	1 66
11	Stott, Cromwell & Co	Chemicals	1 28
12	W. B. Moses & Son	100 desk covers	125 00
12	Keuffel & Esser	1 railroad pen, Land Office	75
12	C. E. Birckhead	Making portfolio drawers, book-cases, &c	240 08
12	J. S. Topham	1 pair saddle bags for Pension Office	8 00
12	Evening Star	Advertising proposals for ice	5 40
12	..... do	Advertising proposals for waste paper	3 90
12	....do	Advertising proposals for miscellaneous supplies.	14 25
12	....do	Advertising proposals for washing towels	4 73
12	..... do	Advertising proposals for fuel	5 75
12	..... do	Advertising proposals for winding clocks	5 06
14	J. Fleister & Son	50 pounds tallow	6 25
14	John C. Parker	14 pocket State maps, 2 revolving book-cases, 1 Star book-case, &c.	62 25
14	N. T. Metzger & Bro	1½ dozen corn brooms	6 00
14	H. Hollander	1 silver-plated pitcher, 1 water-cooler, 3⅓ dozen tumblers, &c.	22 96
14	Baltimore and Ohio Telegraph Company.	Telegraphing for Secretary's office, May	1 32
14	..... do	Telegraphing for Education Office, May	33
15	Philadelphia Ledger	Advertising proposals for miscellaneous supplies.	16 00
15	R. C. M. Burton	Repairing 2 flags for Pension Office	12 00
15	....do	Repairing 1 flag for Education Office	5 00
15	.... do	1 new canvas for Patent Office	30 00
15	E. W. Hayden	1 horse for Pension Office	300 00
16	Willett & Libbey	1,000 feet 4-4 seconds	45 00
17	M. A. Gelwick	1 copy city directory of Springfield, Ill	3 00
17	B. F. Chase	Moving official papers, Pension Office, at Saint Louis.	3 50
17	E. H. King	8 black walnut single desks	240 00
17	J. S. Patterson	Carting office furniture, &c., Pension Office, at Syracuse.	8 00
18	Louis Schmidt & Son	50 red file-boxes for Patent Office	37 50
18	C. E. Birckhead	2 cases of shelving, Patent Office	44 00
19	James Lingenfelter	18 No. 1 single desks, Land Office	540 00
19	E. W. Woodruff	12 file-holders, walnut fronts, 10 by 6½ by 9½	8 82
21	W. B. Williams	Refitting and relaying 60 yards carpet	3 00
21	Chesapeake and Potomac Telephone Company.	Moving telephones from 177 to 81, Patent Office.	5 50
23	James Lingenfelter	3 single black walnut desks	90 00
23	Western Union Telegraph Company.	Telegraphing for railroad office for June	1 27
23	....do	Telegraphing for Education Office for June	1 72
23	Western Union Telegraph Company.	Telegraphing for Secretary's Office, June	8 63
23	....do	Telegraphing for Land Office, June	73 45
23	....do	Telegraphing for Pension Office, June	50 81
24	F. H. Thomas & Co	Florida acts, 1883	2 50
25	F. Shepherd	4 volumes Myers' Federal Decisions	27 00
25	W. H Morrison	Miscellaneous law books	187 00
25	H. Roesser & Son	66 file cases and sections	1,155 00
26	F. Somerville & Son	Castings, fittings, supplies for steam-heating apparatus.	136 75
26	L. Schmidt & Son	Wire guards for doors, windows, and transoms, disbursing room.	165 40
26	A. H. Chace & Bro	Steam-cleaning 1507½ yards carpet for Patent Office	33 17
28	Adams Express Company	Expressage in June for Education Office	5 55

Expenditures on account of contingent fund of Interior Department, &c.—Continued.

Date of payment.	From whom purchased.	Nature of purchases, &c.	Amount.
1884.			
July 31	Wheatley Bros	950 feet 4-4 walnut dressed	$83 75
31	J. W. Drew	5 dozen Law Sons & Hayden's soap	7 50
31	R. C. M. Burton	Repairs on 13 large and medium awnings	80 00
31	....do	Rehanging 43 awnings, 10 pulley blocks	12 20
31	....do	Repairing 2 large awnings	9 00
31	....do	23 awning covers and repairs to awnings	163 00
31	....do	12 awning covers, patching and rebuilding 1 awning.	61 50
31	....do	14 awning covers, and putting up 14 awning hoods. &c.	88 00
31	....do	1 large door and 2 window awnings	20 00
31	....do	1 large window and 3 medium awnings	25 00
31	G. H. Boswell	Repairing boiler north and west wing Patent Office.	6 80
Aug. 1	Chesapeake and Potomac Telephone Company.	Change of 2 telephones, Pension Office	23 70
7	John Keyworth	5 pounds borax	1 00
12	George Ryneal, jr	20 gallons R. S. oil, 1 light glass, 21 x 32	5 48
14	James Lingenfelter	25 small black walnut desks, Land Office	393 75
15	W. H. Hoeke	98 yard matting laid	44 10
16	James Lingenfelter	6 single black walnut desks	180 00
22	Washington Post Publishing Company.	Subscription, July 1, 1883, to June 30, 1884	6 00
23	James Lingenfelter	5 black walnut desks for Patent Office	150 00
23	National Republican	Advertising proposals for waste paper	3 36
23	.... do	Advertising proposals for ice	3 20
23	....do	Advertising proposals for miscellaneous supplies.	6 30
23	....do	Advertising proposals for ice	3 84
23	....do	Advertising proposals for washing towels	3 36
23	....do	Advertising proposals for winding clocks	4 35
28	Conrad Becker	500 58-inch straps, 12 long belt-lacings	52 50
30	James Lingenfelter	8 black walnut single desks	240 00
Sept. 1	E. T. Brooks	Gas-fixtures and hanging	81 50
6	New York Commercial Advertiser.	Advertising proposals for miscellaneous supplies.	13 60
19	James Lingenfelter	17 single black walnut desks	510 00
19	Wickoff, Seaman & Benedict	Repairing type-writer, 1 bottle oil	1 10
19	A. H. Chace & Bro	Exterminating moth and cleaning curtains	8 00
25	James Lingenfelter	14 black walnut desks, single	420 00
Oct. 3	....do	6 black walnut desks, single	180 00
16	Western Union Telegraph Company.	1 telegram from New Mexico	2 30
			9 00
18	Thos. Somerville & Son	20 coils stands	
22	Otis Bros. & Co	Repairs to elevator	37 20
22	James Lingenfelter	6 single black walnut desks	180 00
Nov. 22	Baltimore and Ohio Telegraph Company.	Telegraphing in June	85
22	....do	....do	2 76
	Total expended		100, 566 39
	Balance on hand		685 55
	Total		101, 251 94
		Amount appropriated	101, 000 00
		Amount deficiency appropriation	135 10
		Refundments to appropriation on account of supplies furnished Census Office, Civil Service Commission, and Geological Survey	116 84
			101, 251 94

NOTE.—The vouchers paid from July 1 to November 22, 1884, were for purchases made or contracted for in the fiscal year ended June 30, 1884.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 18.

PURCHASES FOR INTERIOR DEPARTMENT.

LETTER

FROM

THE SECRETARY OF THE INTERIOR,

TRANSMITTING

Statement from the office of the Commissioner of Indian Affairs of purchases exceeding in amount $500 *made in open market, without advertisement, from February* 1, 1884, *to June* 30, 1884.

DECEMBER 8, 1884.—Referred to the Committee on Expenditures in the Interior Department and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, December 4, 1884.

SIR: Section 3 of the act approved July 4, 1884 (Pamphlet Ed. Stats., p. 96) provides—

> That no purchase of supplies for which appropriations are herein made exceeding in the aggregate $500 in value at any one time shall be made without first giving at least three weeks' public notice by advertisement, except in cases of exigency, when, in the discretion of the Secretary of the Interior, who shall make official record of the facts constituting the exigency, and shall report the same to Congress at its next session, he may direct that purchases may be made in open market in amount not exceeding $3,000.

In accordance with the foregoing provision of the act noted, I have the honor to transmit herewith a statement of such open-market expenditures for the Indian service authorized by this Department from February 1 to June 30, 1884, the end of the fiscal year, together with copy of letter of 2d instant from the Commissioner of Indian Affairs, transmitting said statement to this Department.

A statement showing the open-market purchases in excess of $500 by the Indian Office up to February 1, 1884, was submitted to you by this Department under date of February 15 last.

Very respectfully,

H. M. TELLER,
Secretary.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, December 2, 1884.

SIR: In compliance with the request contained in your letter of the 25th ultimo, I have the honor to transmit herewith a statement of the open-market purchases authorized by you during the fiscal year 1884, from February 1 to June 30, inclusive, in excess of $500, with a brief statement of "the facts constituting the contingency" on which each of the purchases was authorized.

Very respectfully,

H. PRICE,
Commissioner.

The Hon. SECRETARY OF THE INTERIOR.

Statement of authorities granted by the honorable Secretary of the Interior for open-market purchases in excess of $500 for Indian goods and supplies for the fiscal year 1884. From February 1 to June 30, 1884, inclusive.

Date of authority.	Amount authorized.	Agency or school.	Object of authority.	Exigency under which authority was granted.
			Purchase of—	
June 30, 1884	$2,900 00	Carlisle school	Lumber, &c., for necessary improvement and repairs.	Required for necessary improvements. No time to advertise before end of fiscal year.
Mar. 12, 1884	1,104 00	Chilocco school	Mules, harness, and plows	Required for immediate use.
Mar. 13, 1884	1,700 00	do	Sundry supplies	Required at once, for equipment of school.
June 9, 1884	1,400 00	do	Fence wire and posts	Required at once, to inclose cattle.
June 12, 1884	842 65	do	Material for wind-mill and tank	Necessary to avail of balance funds on hand for fiscal year.
Apr. 19, 1884	3,000 00	Crow Agency	Material for agency buildings	Required at once. Indians moving from old agency.
May 17, 1884	3,000 00	do	do	Do.
June 9, 1884	3,000 00	do	do	Do.
Mar. 8, 1884	863 93	Colorado River Agency (Yuma school)	Material for building school, and supplies	School needed as early as possible.
Apr. 9, 1884	1,340 00	Devil's Lake Agency	Stallion, and two thrashing machines	Required at once.
Apr. 15, 1884	1,010 00	do	Pork, and platform scales	Do.
May 22, 1884	2,000 00	do	Oxen, and flour	Do.
May 29, 1884	1,500 00	do	Seed-potatoes, beans, &c	Do.
April 1, 1884	1,665 00	Fort Hall Agency	Bacon and flour	Do.
May 19, 1884	1,630 00	do	Flouring mill	Do.
Feb. 7, 1884	950 75	Fort Peck Agency	Seed-potatoes, corn, &c	Required at once for spring planting.
Feb. 21, 1884	1,050 00	do	Wood	Can be purchased cheaper than in the spring. No funds applicable for advertising.
Mar. 5, 1884	1,620 00	do	Beef, bacon, &c	Required at once to relieve starving Indians.
Mar. 8, 1884				
June 11, 1884	700 00	Fort Peck Agency (school)	Engine, pump, &c	Required at once.
Feb. 23, 1884	1,000 00	Fort Belknap Agency	Subsistence supplies	Required at once to relieve starving Indians.
Feb. 6, 1884	1,000 00	Green Bay Agency (school)	Furniture for new school-building	Required at once.
Mar. 11, 1884	1,131 00	Genoa, Nebr. (school)	Farm implements, horses, mules, &c	Required at once. No funds applicable for advertising.
Apr. 23, 1884	2,800 00	do	Material, &c., for laundry building	Required immediately for use of school.
Apr. 21, 1884	1,500 00	Klamath Agency	Ten stallions	No funds applicable for advertising.
June 2, 1884	513 50	Mescalero Agency	Supplies and milch cows	Required before end of fiscal year. No time for advertising.
Feb. 19, 1884	1,000 00	Nevada Agency	Flour and beef	Required at once. No funds applicable for advertising.
Mar. 15, 1884	2,154 00	Navajo Agency	Wagons, harness, and agricultural implements	No funds applicable for advertising.
Mar. 17, 1884	600 00	Navajo Agency (school)	Horses	Do.
Mar. 6, 1884	3,000 00	Osage Agency	Stock cattle, for Kaws	Do.
May 28, 1884	941 00	Nisqually and S'Kokomish Agency	Sundry supplies for schools	Required before end of fiscal year.
Mar. 7, 1884	915 75	Ponca, Pawnee, and Otoe Agency	Shingles, doors, windows, nails, and fence-wire for Poncas.	No funds applicable for advertising.
May 12, 1884	750 00	do	Three spans horses for Poncas	Needed immediately. No funds applicable for advertising.
Mar. 6, 1884	2,100 00	do	Portable saw-mill for Pawnees	No funds applicable for advertising.
Mar. 19, 1884	630 00	Pine Ridge Agency	Range, laundry stove, and sand oven	Do.
Mar. 19, 1884	2,623 15	do	Wagons, machinery, &c	Do.
Mar. 26, 1884	600 00	do	Ten half-spring wagons	Do.

Statement of authorities granted by the honorable Secretary of the Interior, &c.—Continued.

Date of authority.	Amount authorized.	Agency or school.	Object of authority.	Exigency under which authority was granted.
Feb. 7, 1884	$699 00	Rosebud Agency	Seed-potatoes, corn and oats, and garden seeds.	Required immediately for spring planting.
Feb. 18, 1884	1,300 00	do	Two stallions and one jack	No funds applicable for advertising.
Feb. 20, 1884	1,691 25	do	Fence-wire and staples	Required at once. No funds applicable for advertising.
Apr. 29, 1884 June 17, 1884	840 00	do	Four horses	Required at once, owing to death of several on hand and bad condition of others.
Feb. 8, 1884	1,400 00	Standing Rock Agency	Seed-potatoes, corn, and oats, and ten tons hay.	No funds applicable for advertising.
June 27, 1884	1,875 00	do	50,000 pounds flour and 3,000 pounds sugar	Required at once.
May 14, 1884	1,100 00	Santee Agency	American horses for Poncas	Required at once for spring plowing, &c.
Apr. 26, 1884	2,500 00	Shoshone Agency	Subsistence, supplies, seeds, &c	Required at once.
May 13, 1884	600 00	White Earth Agency	Work-oxen for Red Lake Indians.	No funds applicable for advertising.
June 12, 1884	1,000 00	do	Furniture for White Earth school-building	Required before end of fiscal year. No funds applicable for advertising.
Apr. 25, 1884	3,000 00	Yankton Agency	Work-oxen, yokes, and chains	No funds applicable for advertising.
Feb. 27, 1884	1,165 45	Haskell Institute	Mules, agricultural implements, seeds, &c	Needed at once to commence farming operations on school farm.
Feb. 29, 1884	1,555 00	do	Stock cattle, swine, and fowls	No funds for advertising.
Mar. 24, 1884	2,668 95	do	Farm barn, horse barn, and two outhouses	No funds applicable for advertising.
Mar. 29, 1884	3,000 00	do	Goods and supplies	Required at once to open school.
Mar. 31, 1884	1,100 00	do	Posts, lumber, nails, and fence-wire	Required at once to inclose stock.
Apr. 4, 1884	2,692 18	do	Material, &c., for dormitories	To complete buildings which had been advertised and contracted for, in which contract this work was not included.
Apr. 14, 1884	3,000 00	do	Goods and supplies	Required at once to open school.
May 10, 1884	3,000 00	do	do	Do.
May 15, 1884	1,500 00	do	Supplies, lumber, &c	Necessary to complete building before opening school.
June 6, 1884	1,500 00	do	Sundry supplies	Too short time for advertising before close of fiscal year.
June 9, 1884	6,228 00	do	Boilers, pipes, &c., for heating apparatus	No time to advertise and enter into contract before end of fiscal year, when the money would lapse into the Treasury.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 19.

COLLISIONS AT SEA.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING

Letter from the Secretary of State in reference to international regulations for preventing collisions at sea.

DECEMBER 10, 1884.—Referred to the Committee on Commerce and ordered to be printed.

To the House of Representatives:

With reference to the recommendations on the subject in my recent Annual Message, I transmit herewith a report of the Secretary of State, of the 9th instant, showing the necessity for immediate legis'ation for the purpose of bringing the statutes of the United States into conformity with the international regulations for preventing collisions at sea, which have been adopted by all the leading maritime powers of the world except this country.

CHESTER A. ARTHUR.

EXECUTIVE MANSION,
Washington, December 10, 1884.

DEPARTMENT OF STATE,
Washington, December 10, 1884.

To the President:

On the 3d of October last, a note was received by this Department from the honorable L. S. Sackville West, Her Britannic Majesty's minister at this capital, announcing that the international regulations for preventing collisions at sea, which have been adopted by all the leading maritime powers of the world except this country, came into force on the 1st day of September last.

As the statutes of the United States regulating the sailing of American vessels conflict in important particulars with the international regulations now observed by all other civilized nations, there is constant danger of the occurrence of collisions involving serious life and property, owing to the fact that American ships are required by our statutes to

conform to rules in conflict with those observed by the ships of all other maritime powers.

As it is understood that the international regulations in question are entirely acceptable to American ship-owners, it is highly important that Congress should with as little delay as possible bring the provisions of our statute into conformity with the international regulations for preventing collisions at sea.

A copy of the note from the British minister, above referred to, is herewith transmitted.

Respectfully submitted.

FRED'K T. FRELINGHUYSEN.

WASHINGTON, *October* 3, 1884.

SIR: With reference to previous correspondence, I have the honor to inform you that I am instructed by Earl Granville to transmit to you herewith a copy of the revised regulations for preventing collisions at sea, which, under an order in council dated August 19, 1884, came into force on and from the 1st of September last, so far as British ships are concerned. In communicating these regulations to the Government of the United States I am further instructed to state that, as they have been generally agreed to by the several maritime countries and will affect not only all British ships, whether within British jurisdiction or not, but also foreign ships within British jurisdiction, Her Majesty's Government have no doubt that the Government of the United States will take measures to give the regulations in question the force of law as regards their ships; it being understood that the corresponding order in council will thereupon be issued in England.

I have the honor to be, with the highest consideration, sir, your obedient servant,

L. S. SACKVILLE WEST.

Hon. FREDK. T. FRELINGHUYSEN.

[Official copy.]

REGULATIONS FOR PREVENTING COLLISIONS AT SEA, WHICH WILL BE IN FORCE ON AND AFTER THE 1ST DAY OF SEPTEMBER, 1884.

ART. 1. In the following rules every steam ship which is under sail and not under steam is to be considered a sailing ship; and every steam ship which is under steam, whether under sail or not, is to be considered a ship under steam.

Rules concerning lights.

ART. 2. The lights mentioned in the following articles, numbered 3, 4, 5, 6, 7, 8, 9, 10, and 11, and no others, shall be carried in all weathers, from sunset to sunrise.

ART. 3. A seagoing steamship when under way shall carry—

(*a.*) On or in front of the foremast, at a height above the hull of not less than 20 feet, and if the breadth of the ship exceeds 20 feet, then at a height above the hull not less than such breadth, a bright white light, so constructed as to show an uniform and unbroken light over an arc of the horizon of 20 points of the compass, so fixed as to throw the light 10 points on each side of the ship, viz., from right ahead to 2 points abaft the beam on either side, and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least five miles.

(*b.*) On the starboard side, a green light, so constructed as to show an uniform and unbroken light over an arc of the horizon of 10 points of the compass, so fixed as to throw the light from right ahead to 2 points abaft the beam on the starboard side, and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles.

(*c.*) On the port side, a red light, so constructed as to show an uniform and unbroken light over an arc of the horizon of 10 points of the compass, so fixed as to throw the light from right ahead to 2 points abaft the beam on the port side, and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles.

(*d.*) The said green and red side lights shall be fitted with inboard screens projecting at least three feet forward from the light, so as to prevent these lights from being seen across the bow.

ART. 4. A steam ship, when towing another ship, shall, in addition to her side lights, carry two bright white lights in a vertical line one over the other, not less than three feet apart, so as to distinguish her from other steam ships. Each of these lights shall be of the same construction and character, and shall be carried in the same position, as the white light which other steamships are required to carry.

ART. 5. (*a.*) A ship, whether a steam ship or a sailing ship, which from any accident is not under command, shall at night carry, in the same position as the white light which steam ships are required to carry, and, if a steam ship, in place of that light, three red lights in globular lanterns, each not less than 10 inches in diameter, in a vertical line one over the other, not less than three feet apart, and of such a character as to be visible on a dark night with a clear atmosphere at a distance of at least two miles; and shall by day carry in a vertical line one over the other, not less than three feet apart, in front of but not lower than her foremast head, three black balls or shapes, each two feet in diameter.

(*b*) A ship, whether a steam ship or a sailing ship employed in laying or in picking up a telegraph cable, shall at night carry in the same position as the white light which steam ships are required to carry, and, if a steam ship, in place of that light, three lights in globular lanterns each not less than 10 inches in diameter, in a vertical line over one another, not less than 6 feet apart; the highest and lowest of these lights shall be red, and the middle light shall be white, and they shall be of such a character that the red lights shall be visible at the same distance as the white light. By day she shall carry in a vertical line one over the other not less than six feet apart, in front of but not lower than her foremast head, three shapes not less than 2 feet in diameter, of which the top and bottom shall be globular in shape and red in color, and the middle one diamond in shape and white.

(*c.*) The ships referred to in this article, when not making any way through the water, shall not carry the side lights, but when making way shall carry them.

(*d.*) The lights and shapes required to be shown by this article are to be taken by other ships as signals that the ship showing them is not under command, and cannot therefore get out of the way. The signals to be made by ships in distress and requiring assistance are contained in Article 27.

ART. 6. A sailing ship under way, or being towed, shall carry the same lights as are provided by Article 3 for a steam ship under way, with the exception of the white light, which she shall never carry.

ART. 7. Whenever, as in the case of small vessels during bad weather, the green and red side lights cannot be fixed, these lights shall be kept on deck, on their respective sides of the vessel, ready for use; and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side nor the red light on the starboard side.

To make the use of these portable lights more certain and easy, the lanterns containing them shall each be painted outside with the color of the light they respectively contain, and shall be provided with proper screens.

ART. 8. A ship, whether a steam ship or a sailing ship, when at anchor, shall carry, where it can best be seen, but at a height not exceeding 20 feet above the hull, a white light, in a globular lantern of not less than 8 inches in diameter, and so constructed as to show a clear uniform and unbroken light visible all round the horizon, at a distance of at least one mile.

ART. 9. A pilot vessel, when engaged on her station on pilotage duty, shall not carry the lights required for other vessels, but shall carry a white light at the masthead, visible all round the horizon, and shall also exhibit a flare-up light or flare-up lights at short intervals, which shall never exceed fifteen minutes.

A pilot vessel, when not engaged on her station on pilotage duty, shall carry lights similar to those of other ships.

ART. 10. Open boats and fishing vessels of less than 20 tons net registered tonnage, when under way and when not having their nets, trawls, dredges, or lines in the water,

shall not be obliged to carry colored side lights; but every such boat and vessel shall in lieu thereof have ready at hand a lantern with a green glass on the one side and a red glass on the other side, and on approaching to or being approached by another vessel such lantern shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side nor the red light on the starboard side.

The following portion of this article applies only to fishing vessels and boats when in the sea off the coast of Europe lying north of Cape Finisterre:

(*a.*) All fishing vessels and fishing boats of 20 tons net registered tonnage, or upwards, when under way and when not required by the following regulations in this article to carry and show the lights therein named, shall carry and show the same lights as other vessels under way.

(*b.*) All vessels when engaged in fishing with drift nets shall exhibit two white lights from any part of the vessel where they can be best seen. Such lights shall be placed so that the vertical distance between them shall be not less than 6 feet and not more than 10 feet; and so that the horizontal distance between them measured in a line with the keel of the vessel shall be not less than 5 feet and not more than 10 feet. The lower of these two lights shall be the more forward, and both of them shall be of such a character, and contained in lanterns of such construction as to show all round the horizon, on a dark night with a clear atmosphere, for a distance of not less than three miles.

(*c.*) A vessel employed in line fishing with her lines out shall carry the same lights as a vessel when engaged in fishing with drift nets.

(*d.*) If a vessel when fishing becomes stationary in consequence of her gear getting fast to a rock or other obstruction, she shall show the light and make the fog signal for a vessel at anchor.

(*e.*) Fishing vessels and open boats may at any time use a flare-up in addition to the lights which they are by this Article required to carry and show. All flare-up lights exhibited by a vessel when trawling, dredging, or fishing with any kind of drag net shall be shown at the after part of the vessel, excepting that, if the vessel is hanging by the stern to her trawl, dredge, or drag net, they shall be exhibited from the bow.

(*f.*) Every fishing vessel and every open boat when at anchor between sunset and sunrise shall exhibit a white light visible all round the horizon at a distance of at least one mile.

(*g.*) In fog, mist, or falling snow, a drift net vessel attached to her nets and a vessel when trawling, dredging, or fishing with any kind of drag net, and a vessel employed in line fishing with her lines out, shall at intervals of not more than two minutes make a blast with her fog horn and ring her bell alternately.

ART. 11. A ship which is being overtaken by another shall show from her stern to such last-mentioned ship a white light or a flare-up light.

Sound signals for fog, &c.

ART. 12. A steam ship shall be provided with a steam whistle or other efficient steam sound signal, so placed that the sound may not be intercepted by any obstructions, and with an efficient fog horn to be sounded by a bellows or other mechanical means, and also with an efficient bell.* A sailing ship shall be provided with a similar fog horn and bell.

In fog, mist, or falling snow, whether by day or night, the signals described in this Article shall be used as follows; that is to say,—

(*a.*) A steam ship under way shall make with her steam whistle, or other steam sound signal, at intervals of not more than two minutes, a prolonged blast.

(*b.*) A sailing ship under way shall make with her fog horn, at intervals of not more than two minutes, when on the starboard tack one blast, when on the port tack two blasts in succession, and when with the wind abaft the beam three blasts in succession.

(*c.*) A steam ship and a sailing ship, when not under way, shall, at intervals of not more than two minutes, ring the bell.

Speed of ships to be moderate in fog, &c.

ART. 13. Every ship, whether a sailing ship or steam ship, shall in a fog, mist, or falling snow, go at a moderate speed.

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* In all cases where the regulations require a bell to be used, a drum will be substituted on board Turkish vessels.

Steering and sailing rules.

ART. 14. When two sailing ships are approaching one another, so as to involve risk of collision, one of them shall keep out of the way of the other, as follows, viz:

(*a.*) A ship which is running free shall keep out of the way of a ship which is close-hauled.

(*b.*) A ship which is close-hauled on the port tack shall keep out of the way of a ship which is close-hauled on the starboard tack.

(*c.*) When both are running free with the wind on different sides, the ship which has the wind on the port side shall keep out of the way of the other.

(*d.*) When both are running free with the wind on the same side, the ship which is to windward shall keep out of the way of the ship which is to leeward.

(*e.*) A ship which has the wind aft shall keep out of the way of the other ship.

ART. 15. If two ships under steam are meeting end on, or nearly end on, so as to involve risk of collision, each shall alter her course to starboard, so that each may pass on the port side of the other.

This article only applies to cases where ships are meeting end on, or nearly end on, in such a manner as to involve risk of collision, and does not apply to two ships which must, if both keep on their respective courses, pass clear of each other.

The only cases to which it does apply are, when each of the two ships is end on, or nearly end on, to the other; in other words, to cases in which, by day, each ship sees the masts of the other in a line, or nearly in a line, with her own; and by night, to cases in which each ship is in such a position as to see both the side lights of the other.

It does not apply, by day, to cases in which a ship sees another ahead crossing her own course; or by night, to cases where the red light of one ship is opposed to the red light of the other, or where the green light of one ship is opposed to the green light of the other, or where a red light without a green light, or a green light without a red light, is seen ahead, or where both green and red lights are seen anywhere but ahead.

ART. 16. If two ships under steam are crossing, so as to involve risk of collision, the ship which has the other on her own starboard side shall keep out of the way of the other.

ART. 17. If two ships, one of which is a sailing ship and the other a steam ship, are proceeding in such directions as to involve risk of collision, the steam ship shall keep out of the way of the sailing ship.

ART. 18. Every steam ship, when approaching another ship, so as to involve risk of collision, shall slacken her speed or stop and reverse, if necessary.

ART. 19. In taking any course authorized or required by these regulations, a steam ship under way may indicate that course to any other ship which she has in sight by the following signals on her steam whistle, viz:

One short blast to mean "I am directing my course to starboard."

Two short blasts to mean "I am directing my course to port."

Three short blasts to mean "I am going full speed astern."

The use of these signals is optional, but if they are used the course of the ship must be in accordance with the signal made.

ART. 20. Notwithstanding anything contained in any preceding article, every ship, whether a sailing ship or a steam ship, overtaking any other shall keep out of the way of the overtaken ship.

ART. 21. In narrow channels every steam ship shall, when it is safe and practicable, keep to that side of the fairway or mid-channel which lies on the starboard side of such ship.

ART. 22. Where by the above rules one of two ships is to keep out of the way, the other shall keep her course.

ART. 23. In obeying and construing these rules due regard shall be had to all dangers of navigation, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger.

No ship, under any circumstances, to neglect proper precautions.

ART. 24. Nothing in these rules shall exonerate any ship, or the owner, or master, or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper look-out, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

Reservation of rules for harbors and inland navigation.

ART. 25. Nothing in these rules shall interfere with the operation of a special rule duly made by local authority, relative to the navigation of any harbor, river, or inland navigation.

Special lights for squadrons and convoys.

ART. 26. Nothing in these rules shall interfere with the operation of any special rules made by the Government of any nation with respect to additional station and signal lights for two or more ships of war or for ships sailing under convoy.

ART. 27. When a ship is in distress and requires assistance from other ships or from the shore, the following shall be the signals to be used or displayed by her, either together or separately, that is to say:

In the daytime—

1. A gun fired at intervals of about a minute;
2. The International Code signal of distress indicated by N C;
3. The distant signal, consisting of a square flag, having either above or below it a ball, or anything resembling a ball.

At night—

1. A gun fired at intervals of about a minute;
2. Flames on the ship (as from a burning tar barrel, oil barrel, &c.);
3. Rockets or shells, throwing stars of any color or description, fired one at a time, at short intervals.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 20.

INDIAN DEPREDATIONS.

LETTER

FROM THE

ACTING SECRETARY OF THE INTERIOR,

TRANSMITTING,

In compliance with law, an abstract of claims on account of Indian depredations presented to the Secretary of the Interior since February 20, 1884, *together with the action taken thereon and the evidence on which same is based.*

DECEMBER 11, 1884.—Referred to the Committee on Indian Affairs and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, December 10, 1884.

SIR: In compliance with the first clause of section 445, R. S., I have the honor to transmit herewith, the accompanying abstract showing nature, character, and amount of claims presented to the Secretary of the Interior since the date of last report, February 20, 1884, for compensation for depredations committed by Indians, with the action taken thereon and the evidence upon which the action is based.

The claims number 1 to 64, inclusive.

Very respectfully,

M. L. JOSLYN,
Acting Secretary.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

Abstract of claims for losses through depredations by Indians.

No. of claim.	Name and post-office address of claimant.	Amount of claim.	Date of depredation.	Place where depredation was committed.	Date of presentation of claim.	Tribe to which depredators belong.	Amount recommended by Indian office.	Amount allowed by Department.	Date of department action.	Remarks.
1	Levi Shelton, Thurston Co., Wash.	$545 50	Oct. 29, 1855	Thurston Co., Wash..	Dec. 19, 1855	Nisqually.....	$420 50	$420 50	Apr. 15, 1884	
2	A. A. Denny, administrator of W. H. Brannan, deceased, King Co., Wash.	907 00	1855–'56	King Co., Wash	July 12, 1858	White River and other.	907 00	907 00	Apr. 18, 1884	
3	Isaac Woolery, Steilacoom, Wash.	1,575 00	Oct. 1855	Pierce Co., Wash.....	June 3, 1856	Puyallup and other	1,575 00	1,575 00	Apr. 19, 1884	
4	David G. Bacon, Lincoln, Kans...	16,925 00	Aug. 10, 1868	Lincoln Co., Kans.....	.....	Sioux, Cheyenne, &c.	510 00	390 00	Apr. 25, 1884 July 2, 1884	Treaty funds.
5	Mrs. Sarah T. Hiatt, Clearwater, Neb.	5,000 00	Nov. 7, 1882	Clearwater, Nebr	Dec. 22, 1882	Santee Sioux.....	.....	.....	Apr. 28, 1884	
6	H. B. Stone and D. E. Rouse, Gallatin Co., Mont.	15,978 85	Sept. 13, 1877	Gallatin Co., Mont ...	Oct. 16, 1877	Nez Percé.....	4,000 00	4,000 00	May 1, 1884	
7	Mrs. Joanna Barry, Washington, D. C.	1,479 00	Feb. 1870	Near Tucson, Ariz ..	Feb. 8, 1882	Apache.....	1,250 00	.....	May 6, 1884	
8	Abner T. Fitzhugh and S. B. Flowers, Grant Co., Oreg.	4,250 00	July 3, 1878	John Day River, Oreg.	Mar. 14, 1881	Piute and Bannock	3,000 00	3,000 00	May 8, 1884	Treaty funds.
9	John Fisher, Roseburg, Oreg.....	1,960 00	Nov. 1855	Ten Mile Valley, Oreg.	Dec. 3, 1883	Crow Creek	1,500 00	1,500 00	May 19, 1884	
10	C. H. Hale, administrator of Henry Mattice, Olympia, Wash.	1,800 00	Aug. 20, 1855	Thurston Co., Wash..	May 14, 1857	Spokane and Yakima.	1,322 00	.....	May 22, 1884	
11	James E. Williamson, Pierce Co., Wash.	1,697 00	1855–'56	Pierce Co., Wash	Nov. 10, 1856	Puyallup and Nisqually.	1,436 00	1,436 00	May 23, 1884	
12	Elizabeth Tully, administratrix of Michael Tully, Saint Joseph, Mo.	1,496 45	Aug. 8, 1864	Plum Creek, Nebr. ..	Dec. 29, 1865	Cheyenne	1,496 45	.....	May 24, 1884	Treaty funds.
13	Martin W. Fanning, Seven Rivers, N. Mex	200 00	Mar. 31, 1880	Seven Rivers, N. Mex.	Aug. 28, 1880	Mescalero Apache	200 00	200 00	June 9, 1884	
14	Peter Carn, Lincoln Co., N. Mex.	250 00	Mar. 31, 1880	Lincoln Co., N. Mex..	Aug. 16, 1880	....do	250 00	250 00	June 9, 1884	
15	.....do.....	150 00	Sept. 18, 1880	.....do	Dec. 30, 1880	do	150 00	150 00	June 13, 1884	
16	.....do.....	75 00	Feb. 22, 1881	.....do	Jan. 17, 1883	.. do	75 00	75 00	June 13, 1884	
17	.....do.....	75 00	Oct. 1880	.. do	Jan. 17, 1883	....do	75 00	75 00	June 13, 1884	
18	George Brown, Pierce Co., Wash.	1,680 00	Mar. 4, 1856	Pierce Co., Wash	Apr. 21, 1856	Puyallup and Nisqually.	1,295 00	1,295 00	June 13, 1884	
19	Joseph T. Fanning, Lincoln Co., N. Mex.	330 00	Oct. 2, 1880	Lincoln Co , N. Mex..	Jan. 17, 1883	Mescalero Apache	330 00	330 00	June 13, 1884	
20	Ricardo Pino, Socorro Co., N. Mex.	4,000 00	May 22, 1880	Socorro Co., N. Mex...	Nov. 29, 1881	Apache.....	4,000 00	4,000 00	June 14, 1884	
21	William Kincaid, deceased, Pierce Co., Wash.	2,928 00	Sept. 28, 1855	Pierce Co., Wash	June 3, 1856	Puyallup, Nisqually and other.	2,013 00	2,013 00	June 20, 1884	
22	Abram H. Woolery, Pierce Co., Wash.	1,463 00	Oct. 15, 1855	.....do	June 5, 1856	....do	1,000 00	1,000 00	June 21, 1884	
23	John Palmer, Gage Co., Nebr....	3,308 00	Aug. 7, 1864	Gage Co., Nebr.....	Jan. 29, 1883	Pawnee, Arapahoe and other.	3,308 00	3,308 00	June 24, 1884	Treaty funds.

24	Sigmund Ettlinger, Jackson Co., Oreg.	130 00	Aug.	1853	Jackson Co., Oreg	Jan. 19, 1855	Rogue River	130 00	130 00	June 28, 1884	
25	Moore & Brother, Weld Co., Colo.	5, 575 00	Apr.	1867	Weld Co., Colo	Oct. 9, 1873	Sioux, Cheyenne, &c.	4, 740 00	4, 740 00	June 28, 1884	Treaty funds.
26	Daniel Campbell, Crow Wing, Minn.	135 00	July	4, 1881	Crow Wing Co., Minn.	Sept. 1, 1883	Chippewa	75 00	.....	June 30, 1884	Treaty funds.
27	Orville A. Barton, Umatilla Co., Oreg.	225 00	July	1878	Umatilla Co., Ore.	Apr. 16, 1884	Bannocks	225 00	225 00	July 2, 1844	
28	John S. Chisum, Lincoln Co., N. Mex.	39, 310 00	June	1873	Lincoln Co., N. Mex	Jan. 4, 1875	Mescalero Apache	.....	.....	July 7, 1884	
29	Smythe & Babcock, Shakespeare, N. Mex.	13, 640 00	Apr.	21, 1882	Grant Co., N. Mex	May 29, 1882	Apache	10, 230 00	10, 230 00	July 18, 1884	
30	B. F. Ogle, Willow Springs, Oreg	6, 590 00		1878	Umatilla Co., Oreg	June 10, 1884	Bannock	5, 520 00	.....	July 19, 1884	
31	Wm. F. Briggs, Canyonville, Oreg.	75 00	Oct.	1, 1855	Douglas Co., Oreg	Dec. 11, 1883	Umpqua, Crow Creek, &c.	40 00	.....	July 21, 1884	
32	V. B. Peterson, Umatilla, Co., Oreg.	1, 300 00	July	1878	Umatilla Co., Oreg	Jan. 31, 1884	Bannock	1, 200 00	.....	July 23, 1884	
33	Henry Bowman, Umatilla Co., Oreg	7, 515 00	July	1878	....do	Jan. 28, 1884	....do	5, 750 00	.....	July 23, 1884	
34	Francis H. Kearney, Pilot Rock, Oreg.	894 00	July	1878	....do	Jan. 31, 1884	....do	640 00	640 00	Sept. 11, 1884	
35	Leonard Kearney, Pilot Rock, Oreg	1, 725 00	July	1878	....do	Jan. 31, 1884	....do	1, 725 00	1, 725 00	Sept. 10, 1884	
36	R. G. Hackett, Pilot Rock, Oreg.	710 00	July	1878	....do	Jan. 31, 1884	Bannock or Snake.	520 00	520 00	Sept. 10, 1884	
37	William McBean, Walla Walla Co., Wash.	2, 610 00		1885	Walla Walla County, Wash.	July 4, 1856	Yakima, Cayuse, and others.	1, 966 50	1, 966 50	Sept. 11, 1884	
38	Charles E. Finch, Pilot Rock, Oreg.	280 00	July,	1878	Umatilla County, Oreg.	Jan. 29, 1884	Bannock or Snake.	230 00	230 00	Sept. 11, 1884	
39	E. J. Alexander, Pilot Rock, Oreg.	290 00	July,	1878	.....do	Jan. 29, 1884	Bannock	250 00	250 00	Sept. 10, 1884	
40	William A. Bowman, Pendleton, Oreg.	930 00	July,	1878	.....do	Jan. 28, 1884	Bannock or Snake.	630 00	630 00	Sept. 10, 1884	
41	John McBean, Pendleton, Oreg.	200 00	July,	1878	..... do	Dec. 17, 1883	do	200 00	200 00	Sept. 11, 1884	
42	John Jumper (Seminole), Seminole Nation, Ind. T.	1, 020 00		1866	Seminole Nation, Ind. T.	Aug. 8, 1883	Osage	680 00	680 00	Sept. 11, 1884	Treaty funds.
43	S. L. Morse and M. A. Disoway, Pendleton, Oreg.	3, 120 00	July,	1878	Umatilla County Oreg.	May 21, 1884	Nez Percé	3, 120 00	3, 120 00	Sept. 10, 1884	
44	William R. Price, Clay Co., Mo	3, 750 00	May,	1865	Between Leavenworth and Fort Larned.	May 30, 1883	Kiowa and Comanche.	3, 000 00	3, 000 00	Sept. 11, 1884	Treaty funds.
45	Ricardo Rino, San Antonio, N. Mex.	12, 100 00	Feb.	21, 1866	Socorro County, N. Mex.	June 4, 1884	Navajo	12, 100 00	.....	Dec. 1, 1884	
46	Antonio y M. Abeytia, Socorro Co., N. Mex.	11, 500 00	Nov.	25, 1857	....do	July 24, 1884	Navajo and Apache.	11, 100 00	.....	Dec. 1, 1884	
47	Zook & Alderson, Miles City Mont.	6, 340 41	Mar.	18, 1884	Custer County, Mont.	Apr. 28, 1884	Northern Cheyenne.	4, 739 83	.....	Dec. 5, 1884	Treaty funds.
48	Mille Lac Improvement Company, Minneapolis, Minn.	1, 250 00	Sept.	22, 1883	Run River, Minn	Feb. 2, 1884	Mille Lac	200 00	.....	Dec. 5, 1884	Treaty funds.
49	Charles and Garrett Sigsby, Pleasant Valley, Ariz.	5, 094 50	June	17, 1881	Yavapai County, Ariz.	Oct. 31, 1881	San Carlos Apache	2, 547 25	.....	Dec. 9, 1884	
50	J. L. Peck, Decatur Co., Kans.	1, 221 42	Sept.,	1878	Decatur County, Kans.	July 30, 1883	Northern Cheyenne.	323 42	.....	Dec. 9, 1884	Treaty funds.

Abstract of claims for losses through depredations by Indians—Continued.

No. of claim.	Name of claimant and post-office address.	Amount of claim.	Date of depredation.	Place where depredation was committed.	Date of presentation of claim.	Tribe to which depredators belong.	Amount recommended by Indian office.	Amount allowed by Department.	Date of Department action.	Remarks.
51	Aggy Daren, Chickasaw Nation..	$4,250 00	Sept., 1866	Chickasaw Nation, Ind. T.	Dec. 18, 1868	Comanche	$2,125 00			
52	C. A. Burris, Chickasaw Nation..	1,725 00	Dec., 1866	.....do	Dec. 18, 1868	...do	1,150 00			
53	James Shirah-ha, Chickasaw Nation.	1,500 00	Oct., 1866	..... do	Dec. 19, 1868	....do	750 00			
54	Edward Leader, Chickasaw Nation.	3,230 00	Sept., 1866	.....do	Dec. 18, 1868	... do	2,153 34			
55	John Newberry, Chickasaw Nation.	18,535 00	Sept., 1866	.... do	Dec. 16, 1868	... do	9,267 50			
56	Reuben James, Chickasaw Nation.	1,640 00	Sept., 1866	..... do	Dec. 14, 1868	... do	1,230 00			
57	Booker James, Chickasaw Nation.	500 00	Dec., 1867	.....do	Dec. 15, 1868	... do	400 00			
58	Ho-par-kin-tubbie, Chickasaw Nation.	5,850 00	Dec., 1866	.....do	Dec. 19, 1868	.. do	3,900 00	.....	Dec. 10, 1884	Treaty funds.
59	I'she-tick-i-you, Chickasaw Nation.	2,700 00	Sept., 1866	..... do	Dec. 18, 1868	....do	1,800 00			
60	A. B. Johnson, Chickasaw Nation.	2,800 00	Dec., 1867	.....do	Dec. 19, 1868	... do	2,025 00			
61	George T. Wilson, Chickasaw Nation.	1,860 00	Sept., 1866	.....do	Dec. 18, 1868	....do	1,395 00			
62	Robert Cut-chubby, Chickasaw Nation.	1,420 00	Dec., 1867	.....do	Jan. 2, 1869	....do	1,065 00			
63	Ho-pi-ah-tubby, Chickasaw Nation.	2,775 00	Sept., 1866	..... do	Dec. 18, 1868	... do	2,081 25			
64	Shum-ho-ka, Chickasaw Nation ..	2,000 00	Jan., 1868	.....do	Dec. 14, 1868	... do	1,600 00			

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. DOC. No. 21.

POSTMASTERS' CLAIMS FOR LOSSES BY FIRE, ETC.

LETTER

FROM

THE ACTING POSTMASTER-GENERAL,

TRANSMITTING,

As required by act of March 17, 1882, *lists of claims allowed and disallowed for losses by postmasters from fire, burglary, and other casualties.*

DECEMBER 11, 1884.—Referred to the Committee on Appropriations and ordered to be printed.

POST-OFFICE DEPARTMENT,
OFFICE OF THE POSTMASTER-GENERAL,
Washington, D. C., December 11, 1884.

SIR: In obedience to the requirements of the act of Congress entitled "An act authorizing the Postmaster-General to adjust certain claims of postmasters for loss by burglary, fire, or other unavoidable casualty," approved March 17, 1882, I transmit to Congress two lists of claims, marked respectively Exhibit A and Exhibit B, showing the action taken thereon by the Postmaster-General.

Exhibit A is a list of all claims allowed from December 1, 1883, to December 1, 1884, showing the date, character, and cause of loss, and the amount allowed in each case.

With reference to these cases, it may be stated in general terms that after careful investigation the Postmaster-General was of opinion that the losses resulted from no fault or negligence on the part of the respective claimants.

Exhibit B is a list of all claims disallowed during the period above referred to, showing in each instance the date, character, and cause of loss, the amount claimed when definitely stated, and the reasons for the adverse action of the Postmaster-General.

Very respectfully,

JNO. SCHUYLER CROSBY,
Acting Postmaster-General.

Hon. JOHN G. CARLISLE,
Speaker, House of Representatives.

EXHIBIT A.

Post-offices.	Postmasters.	Date of loss.	Cause of loss.	Amount allowed.		
				Stamps.	Money-order funds.	Total.
Alta Vista, Mo	J. M. Harman	Feb. 12, 1883	Fire	$12 00		$12 00
Akron, Pa	S. Wolf	May 8, 1876	Burglary	45 00		45 00
Antonia, Mo	J. Yerger	Mar. 29, 1882	Fire	43 63		43 63
Anoka, Minn	J. A. Foote	Nov. 1, 1883	Burglary	60 90		60 90
Apopka, Fla	W. R. McLeod	Mar. 14, 1883	do	113 73	$12 52	126 25
Annawan, Ill	Mrs. Mary M. Lamb	June 26, 1872	Fire	15 00		15 00
Do	do	Apr. 11, 1874	Burglary	116 37		116 37
Aniwa, Wis	W. W. Warner	Jan. 8, 1884	Fire	25 35		25 35
Altoona, Fla	F. J. Hinson	Dec. 29, 1883	do	11 75		11 75
Annapolis, Md	Grafton Munroe	Feb. 4. 1884	Burglary†			
Arkansas City, Ark	H. Thane	Jan. 23, 1884	Fire	11 20		11 20
Albion, Pa	J. A. Robison	Feb. 10, 1884	do	39 05		39 05
Amesbury, Mass	James W. Goodrich	Feb. 21, 1884	Burglary	401 84	22 93	424 77
Alfred, Kans	Adam B. Lind	Aug. 22, 1883	Fire	4 60		4 60
Ashford, Conn	W. M. Whitaker	Feb. 26, 1882	do	28 50		28 50
Alma Mine, Mo	W. H. H. Miller	Aug. 7, 1882	do	50 00		50 00
Avalon, Mo	William Beauchamp	Apr. 9, 1884	Burglary		24 00	24 00
Albany, Wis	John Lemuel	Nov. 27, 1883	Fire	125 62		125 62
Allegan, Mich	George R. Stone	Mar. 12, 1884	do	62 84		62 84
Alabama Furnace, Ala	John E. Ware	Nov. 14, 1883	do	14 71		14 71
Badus, Dak	G. A. Harth	Dec. 23, 1882	do	20 47		20 47
Beaver City, Nebr	John R. Brown	Jan. 16, 1879	Burglary	67 56		67 56
Berlin, N. J	Thomas T. Smith	Dec. 14, 1881	do	62 15		62 15
Boonville, Ind	G. L. Masters	Nov. 8, 1882	do	304 50	105 91	410 41
Boaz, Ill	W. A. Downey	Dec. 16, 1882	Fire	60 87		60 87
Best, N. C	J. A. Porter	Nov. 7, 1882	do	25 00		25 00
Bath, N. Y	D. C. Alden	Dec. 19, 1883	Burglary	473 81		473 81
*Boonton, N. J	E. B. Dawson	Apr. 6, 1883	do	235 80	41 23	277 03
Bobtown, W. Va	J. Morris	Dec. 24, 1878	Fire	5 14		5 14
Balston, N. Y	E. F. Grose	Oct. 12, 1883	Burglary	66 00	14 37	80 37
Bridgewater, Mass	Lewis Holmes	May 27, 1881	do	81 50		81 50
Bainbridge, Ohio	A. E. McGoffin	Aug. 15, 1874	do		79 92	79 92
Blountville, Ala	James M. Wooten	July 15, 1878	do	27 81		27 81
Bloomfield, Conn	H. W. Rowley	Mar. 24, 1883	do	69 00		69 00
Bartlett, Ill	E. C. Guild	Sept. 29, 1883	do	5 85		5 85
Bell's, Tex	B. R. Sanders	Nov. 27, 1883	do	32 46		32 46
Bellevue, Ala	A. P. Leiser	Sept. 19, 1874	do	54 95		54 95
Bernadotte, Ill	W. S. Strode	Feb. 16, 1883	Flood	55 62		55 62
Black Point, Cal	J. B. Swetzer	May 25, 1876	Fire	34 49		34 49
Baldwins, N. Y	W. Bedell	Aug. 16, 1877		21 00		21 00

Black River Falls, Wis	John Parsons	May 29, 1882	Burglary	154 60	.....	154 60
Brookfield, Ohio	James Dilley	Oct. 8, 1883	Fire	17 14	.....	17 14
Bristol, Conn	Silas M. Norton	June 19, 1883	Burglary	533 44	143 08	676 52
Blue Island, Ill	Fred. G. Diefenbach	Jan. 28, 1884	do	146 16	83 81	229 97
Benton, N. H	P. W. Allen	Sept. 27, 1883	Fire	54 82	.....	54 82
Belpre, Ohio	J. M. Stone	Feb. 8, 1884	Flood	6 46	.....	6 46
Bedford, N. Y	W. O. Scribner	Sept. 25, 1875	Burglary	20 00	.....	20 00
Bayminette, Ala	D. C. Byrne	Nov. 2, 1883	Fire	21 90	.....	21 90
Braddock, Pa	W. W. McCleary	Nov. 5, 1883	Burglary	524 93	72 24	597 17
Byesville, Ohio	George Conner	Mar. 24, 1884	do	61 58	.....	61 58
Boone, Ark	Felix Wilson	Oct. 18, 1883	Flood	17 85	.....	17 85
Buffalo, Iowa	A. H. Dorman	Oct. 6, 1883	Burglary	47 89	.....	47 89
Brashear, Mo	James N. McCreary	Aug. 22, 1883	Fire	25 00	.....	25 00
Brooklyn, Ind	B. L. Gregory	June 17, 1882	do	59 40	.....	59 40
Belleville, N. J	W. H. Stephens	Oct. 14, 1875	Burglary	68 40	.....	68 40
Beetown, Wis	Goodpell Lamson	May 27, 1867	do	44 35	.....	44 35
Brashear, Mo	J. N. McCreary	May 2, 1884	do	93 00	.....	93 00
Brandenburg, Ky	W. W. Boling	July 28, 1883	do	49 70	.....	49 70
Bean Blossom, Ind	Hiram Waltman	Apr. 17, 1884	Fire and burglary	71 93	.....	71 93
Bellview, Tenn	N. M. Morton	Mar. 17, 1878	Fire	8 39	.....	8 39
Bath, Ga	L. B. Elliott	Mar. 12, 1883	do	15 63	.....	15 63
Balch, Mich	John Britton	Feb. 28, 1884	do	10 00	.....	10 00
Big Spring, Mich	Norman Harris	Jan. 23, 1884	do	4 25	.....	4 25
Box Spring, Ga	William Green	Dec. 27, 1883	do	14 88	.....	14 88
Bushbury, Nebr	Stephen Hulfish	Feb. 3, 1884	Burglary	35 00	.....	35 00
Bull's Gap, Tenn	G. S. Mooney	Sept. 27, 1883	Fire	18 76	.....	18 76
Bonus, Ill	John Woodruff	Feb. 27, 1884	Burglary	49 41	.....	49 41
Bainbridge, Nebr	W. H. Stratton	Mar. 4, 1884	do	14 70	.....	14 70
Brushy Fork, Ill	H. Watson	June 20, 1882	Fire	59 34	.....	59 34
Butlerville, Ind	Emmar Ware	Jan. 23, 1868	Burglary	115 00	.....	115 00
Boston, Mass	Edward S. Tobey	June 12, 1884	do	313 59	217 81	531 40
Bloomertown, Ohio	W. W. Sando	Apr. 24, 1882	do	34 50	.....	34 50
Barnard, Ind	William Hovermale	July 19, 1882	Fire	15 82	.....	15 82
Belcher, Ark	B. A. Thalheimer	Jan. 15, 1883	do	31 50	.....	31 50
Calico, Cal	W. L. G. Soule	June 10, 1883	do	35 00	.....	35 00
Colfax, Iowa	William L. West, jr	June 6, 1883	Burglary	80 43	51 00	131 43
Concord, N. H	L. H. Carroll	Sept. 5, 1883	do	1,534 11	86 18	1,620 29
Coohocque, N. C	E. F. Hukins	Dec. 27, 1881	Fire	54 67	.....	54 67
Do	do	Mar. 4, 1883	do	7 68	.....	7 68
Courtland Station, Ill	Joseph Adams	Apr. 21, 1883	Burglary	11 50	.....	11 50
Casscoe, Ark	Moses Katz	Feb. 16, 1883	Fire	15 60	.....	15 60
Clinton, Ind	John G. Campbell	Nov. 12, 1874	Burglary	179 11	.....	179 11
Coleman, Miss	W. B. Hawkins	Aug. 31, 1879	Fire	12 00	.....	12 00
Clifton, W. Va	H. G. Nease	Aug. 30, 1882	Burglary	58 00	.....	58 00
Curran, Ill	Samuel F. Foster	June 26, 1883	do	61 96	.....	61 96
Chipman's Point, Vt	W. G. Corbett	June 6, 1883	do	38 53	.....	38 53
Collin's Centre, N. Y	C. J. Bates	June 7, 1882	do	35 00	.....	35 00
Clare, Mich	J. C. Rockafellow	Nov. 5, 1883	Fire	48 85	.....	48 85
Cochituate, Mass	A. H. Bryant	Nov. 10, 1883	Burglary	117 17	.....	117 17
Cadiz, Ky	H. M. Garton	Dec. 13, 1883	Stolen in transit	.....	44 80	44 80

† Transmitted all papers to Congress, with the recommendation that credit be authorized to the amount of $3,655.52 for postage stamps, and $659.61 for money-order funds.

EXHIBIT A—Continued.

Post-offices.	Postmasters.	Date of loss.	Cause of loss.	Amount allowed.		
				Stamps.	Money-order funds.	Total.
Cisco, Tex	D. Redfield	Jan. 18, 1883	Fire	$9 40		$9 40
Cadiz, Ky	H. M. Garton	Mar. 30, 1883	Stolen in transit		$140 00	140 00
Canton, Minn	James Manuel	Nov. 19, 1883	Burglary	102 80		102 80
*Carbonateville, Colo	D. J. Chadwick	Sept. 19, 1879	do	302 06		302 06
Centre Square, Ind	D. M. Rodgers	Oct. 18, 1878	do	17 16		17 16
Caborn, Ind	Walter S. Caborn	Oct. 9, 1883	Fire	22 00		22 00
Cypress, Ind	E. W. Blangy	Feb. 15, 1883	Flood	10 00		10 00
Catlin, Ind	Will H. Elson	June 1, 1883	Fire	35 00		35 00
Camden, Kans	William A. Lowei	Oct. 13, 1882	Burglary	108 50		108 50
Coden, Ala	F. L. Girard	Dec. 28, 1882	Fire	16 24		16 24
Corinne, Utah	T. J. Black	Nov. 3, 1878	do	50 00		50 00
Crescent, Iowa	H. Swanson	Jan. 17, 1884	Burglary	30 70		30 70
Crutchfield, Ky	John H. Cayce	Mar. 2, 1884	Fire	4 55		4 55
Canton, Ill	P. W. Slaughter	Sept. 7, 1882	Burglary	83 81	115 00	198 81
Clifton Mills, Wis	M. A. Taylor	July 25, 1883	do	11 45		11 45
Conehatta, Miss	Frank Smith	Oct. 15, 1883	Fire	8 25		8 25
Cassville, Mo	E. Messer	Dec. 10, 1883	Lost in transit		50 00	50 00
Chase, Ohio	S. Woodyard	June 29, 1883	Fire	18 90		18 90
Caledonia, Miss	E. E. Southall	Mar. 10, 1884	Burglary		68 56	68 56
Canton, Ill	P. W. Slaughter	Sept. 7, 1882	do	93 67		93 67
Centreville, Minn	L. Wenks	Feb. 2, 1874	Fire	5 04		5 04
Clayton, Kans	E. L. Pease	Feb. 2, 1883	do	6 60		6 60
Canaseraga, N. Y	W. C. Mathews	June 16, 1882	Burglary		57 57	57 57
Centre, Miss	J. F. Williams	Mar. 11, 1884	Cyclone	12 10		12 10
Clymer, N. Y	W. B. Blodgett	Oct. 1, 1880	Burglary	119 99	105 08	225 07
Camp, Minn	S. P. Nelson	Mar. 7, 1884	Fire	19 00		19 00
Consville, Mo	James H. Sheldon	Feb. 11, 1884	do	89 39		89 39
Covington, Ga	W. T. Wells	Dec. 31, 1883	do	167 00		167 00
Cottonwood Springs, Nebr	M. J. Cohn	Sept. 8, 1882	do	8 70		8 70
Carr's Station, Ga	Julian West	Feb. 2, 1884	do	26 16		26 16
Cartersville, Ga	J. R. Wikle	Nov. 1, 1881	Stolen in transit		280 00	280 00
Cobb, Ala	Elias Casper	Nov. 13, 1883	Fire	25 45		25 45
Cotile, La	W. H. Simons	Jan. 25, 1884	do	17 45		17 45
Columbiana, Ala	J. W. Jones	Dec. 6, 1883	Burglary	88 70	12 97	101 67
Chestnut Fork, Va	John A. Wilson	May 22, 1884	Fire	38 57		38 57
Clear Creek, Ind	P. B. Martin	Oct. 2, 1877	Burglary	20 33		20 33
Chase, Mich	S. F. Mullin	Jan. 24, 1882	Fire	38 90		38 90
Coeyman's Hollow, N. Y	Israel Shear	Aug. 9, 1881	Burglary	36 91		36 91
Cody, Va	L. M. Thocker	Sept. 28, 1883	Fire	16 36		16 36
Casey Creek, Ky	D. L. Edrington	Jan. 2, 1883	do	21 66		21 66

Colfax, Wash	L. P. Berry	Mar. 15, 1884	....do	112 30		112 30
Chappells, S. C	J. R. Irwin	Feb. 19, 1884	Cyclone	48 15		48 15
Concord, Ky	J. M. Freeman	Aug. 30, 1876	Burglary	26 33		26 33
Caseyville, Ky	D. A. Broaks, jr	Feb. 21, 1884	Flood	16 12		16 12
Covert, Kans	J. M. Bradshaw	Feb. 23, 1882	Fire	37 07		37 07
Chapin, Ill	J. K. Burnham	May 7, 1873	Burglary	87 00		87 00
Dlo, Miss	Mary F. May	Apr. 22, 1883	Cyclone	1 12		1 12
Decatur, Tex	G. Salmon	Oct. 25, 1881	Lost in transit		295 00	295 00
Dunkirk, Ind	R. J. Sutton	Apr. 4, 1876	Burglary	21 19		21 19
Dallas Centre, Iowa	O. N. Steele	June 1, 1883	Burglary	232 79		232 79
Darlington Md	H. C. Whiteford	Nov. 29, 1883	....do	114 42		114 42
Demarest, N. J	J. A. Van Buskirk	Oct. 18, 1875	....do	35 00		35 00
Dupage, Ill	Samuel Anglemire	Sept. 19, 1883	Fire	5 49		5 49
Dorchester, Ill	W. T. Keas	Mar. 16, 1882	Burglary	93 65		93 65
Dakota, Ill	J. R. Young	July 13, 1880	....do	83 62		83 62
Dysart, Iowa	J. L. Spayde	Mar. 31, 1883	....do	180 00		180 00
Decatur, Ind	Shaffer Peterson	Dec. 1, 1883	.... do	31 62		31 62
Dresden, Tenn	Mary A. Reavis	Nov. 5, 1883	Lost in transit		10 00	10 09
Do	....do	Oct. 10, 1883	Burglary	31 00		31 00
Danford, Ohio	William Norris	Nov. 10, 1883	... do	36 91		36 91
Dido, Miss	W. M. Dalton	Apr. 22, 1883	Cyclone	22 70		22 70
Delwin, Mich	Marcellus Kohler	Feb. 10, 1884	Fire	11 96		11 96
Davisborough, Ga	A. Herrman	Feb. 19, 1884	Cyclone	7 68		7 68
Durham, Iowa	M. Eikenberry	Oct. 25, 1883	Fire	36 18		36 18
Daytonville, Iowa	William L. Hewitt	Nov. 7, 1883	Burglary	30 36		30 36
Dales Mill, Ga	Fulton W. Dale	Apr. 2, 1884	Fire	11 10		11 10
Deetsville, Ala	J. O. Jeffries	May. 10, 1878	....do	12 13		12 13
Dover, Mich	Edwin A. Thompson	Aug. 14, 1884	.... do	65 12		65 12
Denmark, Kans	T. L. Jenson	Sept. 15, 1879	.... do	4 60		4 60
Eagle Springs, Tex	G. A. Strickland	Oct. 3, 1876	....do	23 12		23 12
Edwardsburg, Mich	M. H. Lee	Nov. 24, 1882	Burglary	47 95		47 95
Eden, Me	L. J. Thomas	July 7, 1877	do	30 00		30 00
Evans, Colo	N. H. Talbot	Mar. 31, 1883	Fire	100 00		100 00
Engle, N. Mex	Alex. Rogers	Aug. 27, 1883	....do	28 00		28 00
Eyota, Minn	Charles R. Blair	Sept. 28, 1883	Burglary		2 26	2 26
Eddyville, Iowa	E. M. Fausnaugh	Nov. 7, 1883	....do	142 12		142 12
Edenville, Iowa	Alfred White	Sept. 16, 1881	Fire	35 00		35 00
East River, Conn	Samuel D. Cruttenden	Oct. 17, 1883	Burglary	100 50		100 50
Enterprise, Ga	J. Dobbins	Mar. 27, 1878	Fire	8 11		8 11
East Benton, Me	H. M. Robinson	June 26, 1876	....do	9 60		6 60
Essex Junction, Vt	E. A. Beach	Aug. 7, 1875	Burglary	67 88		67 88
Essex, Conn	Charles S. Munger	June 13, 1883	....do	153 80	6 52	160 32
Edgerly, La	J. T. Davidson	May 3, 1883	Fire	19 66		19 66
Elmwood, Mich	W. W. Hargrave	Jan. 20, 1884	....do	63 12		63 12
Eagle Cliff, Ga	James C. Ellis	Dec. 7, 1882	....do	15 09		15 09
Elmo, Ky	G. H. Allen	Mar. 7, 1883	....do	35 00		35 00
Enola, Ark	S. E. Lamar	Jan. 4, 1883	.... do	38 12		38 12
Eylar, Ill	G. W. Langford	June 12, 1883	....do	16 88		16 88
Ellington, Conn	James W. Eaton	June 10, 1883	Burglary	38 38		38 38
Elm, Pa	George W. Campbell	May 22, 1884	Fire	102 88		102 88
Fairfield, Pa	J. M. Musselman	Oct. 17, 1829	Burglary	102 87		102 87
Floresville, Tex	W. C. Agel	Sept. 23, 1882	Stolen in transit		13 00	13 00

EXHIBIT B—Continued.

Post-offices.	Postmasters.	Date of loss.	Cause of loss.	Amount allowed.		
				Stamps.	Money-order funds.	Total.
Farmington, Conn	Chauncey Rose	July 9, 1883	Burglary	$71 93		$71 93
Forest, Ohio	W. F. Pierce	Dec. 28, 1880	Lost in transit		$100 00	100 00
Fontana, Kan	L. H. Gormley	Dec. 22, 1872	Fire	1 87		1 87
French Grove, Ill	J. Y. Coe	Sept. 5, 1882	do	28 35		28 35
Franklin, Ind	Thomas B. Wood	Nov. 14, 1876	Burglary	383 20		383 20
Fontanelle, Nebr	O. Lewis	Apr. 5, 1883	do		$25 36	25 36
Frankfort, Ky	J. T Hatchitt	Nov. 11, 1882	Fire	480 78		480 78
Flat River, N. C	G. S. Scruggs	Dec. 28, 1881	do	26 13		26 13
Franklin, Minn	E. S. Johnson	Jan. 7, 1884	do	10 75		10 75
Forestville, Ga	F. W. Quarles	July 21, 1883	do	19 67		19 67
Florida, Ohio	Henry L. Weaver	Nov. 21, 1883	Burglary	12 01		12 01
Fowlstown, Ga	C. J. Munnerlyn	Nov. 28, 1883	Fire	10 97		10 97
Flemington, N. J	N. G. Smith	Nov. 12, 1873	Burglary	822 72		822 72
Freeport, Va	T. B Rowe	Nov. 19, 1881	Fire	20 53		20 53
Fulton, Ark	H. W. Ferguson	Sept. 28, 1883	do	212 29		212 29
Franklin, N. Y	E. A. Chamberlain	Nov. 28, 1874	Burglary	139 95		139 95
Grafton, Cal	F. A. Grimes	June 6, 1883	do	14 63		14 63
Glendale, Mass	Charles Goodrich	May 23, 1882	do	80 07		80 07
Grand Meadow, Minn	Rollin Dunbar	Sept. 17, 1882	Fire	32 70		32 70
Guilford, Mo	J. P. Hawk	Aug. 25, 1881	Burglary	43 43		43 43
Garfield, Iowa	P. H. Ottsen	June 27, 1883	do	115 75	62	116 37
Garfield, Colo	E. A. Sperry	Oct. 30, 1883	Fire	19 56		19 56
Gladstone, Miss	N. K. White	July 27, 1881	do	24 40		24 40
Gloucester, Mass	David W. Low	Oct. 1, 1883	Burglary	584 42	656 98	1,241 40
Guerneville, Cal	G. Dietz	May 23, 1883	Fire	221 21		221 21
Galesville, N. Y	W. L. Robinson	May 23, 1883	Burglary	42 00		42 00
Green Cove Springs, Fla	Thomas Roberts	Dec. 24, 1881	Fire	102 20		102 20
Georgetown, S. C	E. Atkinson	Dec. 25, 1882	do	170 18		170 18
Grant's Lick, Ky	N. D. Orcutt	Mar. 4, 1884	do	20 00		20 00
Goose Lake, Iowa	Peter A. Gohlman	Feb. 22, 1884	do	19 80		19 80
Gladwin, Mich	Peter H. Moore	Jan. 1, 1884	do	61 25		61 25
Guest's Station, Va	John B. Corn	Dec. 9, 1882	Burglary	10 00		10 00
Goldman, Ark	S. D. Whaling	Mar. 14, 1884	Fire	60 43		60 43
Galva, Kans	Alex. G. Robb	Jan. 24, 1884	do	26 90		26 90
Geneva, N. Y	E. B. Webster	May 28, 1884	Burglary	126 89	10 74	140 63
Gaines, N. Y	R. Andrews	Sept. 11, 1882	do	28 98		28 98
Greenup, Ill	D. C. Robertson	June 16, 1884	do	149 60		149 60
Gouverneur, N. Y	Horace G. Reynolds	July 15, 1884	Fire	56 07		56 07
Gadsden, Tenn	R. J. Williams	Mar. 19, 1884	do	18 60		18 60
Glenville, Ohio	William G. Jones	Apr. 15, 1884	Burglary	33 37		33 37

Greenfield, Ill	William M. Ward	Dec. 31, 1882	Fire	142 12	.....	142 12
Hickory Valley, Ark	McC. Hail	Mar. 13, 1881	do	19 38	.....	19 38
Heron Lake, Minn	J. F. Force	July 5, 1883	Burglary	83 07	.....	83 07
Hopewell Academy, Mo	H. Schawengerdt	June 19, 1876	do	9 29	.....	9 29
Houtzdale, Pa	J. S. Berkstresser	May 6, 1881	Fire	19 58	.....	19 58
Huntington, Ind	A. W. De Long	Sept. 10, 1882	Burglary	1, 095 00	45 34	1, 140 34
Hampstead, N. H	R. C. Smith	May 2, 1871	do	54 00	.....	54 00
Highland, N. Y	Joseph De Graff	Jan. 26, 1883	do	327 80	.....	327 80
Haverhill, Mass	William E. Blunt	Oct. 31, 1883	do‡	.....	.....	.....
Haskins, Ohio	P. J. Feagles	Apr. 6, 1882	do	111 50	.....	111 50
Hunts, N. Y	Milo Eldridge	Mar. 18, 1876	Burglary	36 50	.....	36 50
Hall's Summit, Kans	E. E. Hale	Jan. 13, 1881	Fire	24 00	.....	24 00
Holly, Mich	David Hobart	Nov. 3, 1883	Highway robbery	356 99	5 00	361 99
Huntsville, Tenn	G. W. Strunk	Aug. 24, 1876	Burglary	79 65	.....	79 65
Hadley, Ind	Charles Holmes	Apr. 14, 1882	do	49 53	.....	49 53
Harmar, Ohio	Mrs. Lydia Young	Feb. 6, 1884	Flood	7 37	.....	7 37
Hunt's City, Ill	E. W. Park	Nov. 16, 1881	Fire	13 59	.....	13 59
Hector, Minn	W. D. Griffith	Aug. 7, 1883	Burglary	.....	116 30	116 30
Hancock, Colo	Charles E. Parlin	Feb. 7, 1884	Fire	11 10	.....	11 10
Hamowock, N. Y	A. Newkirk	Oct. 22, 1878	do	28 70	.....	28 70
Havana, Ala	W. T. Martin	Feb. 21, 1884	Burglary	25 00	.....	25 00
Hortense, Colo	W. W. Fletcher	May 28, 1884	Fire	3 40	.....	3 40
Harrisville, Va	James Wendel	Nov. 26, 1883	do	45	.....	45
Hawthorne, Ill	James M. Jackson	Feb. 6, 1883	do	29 34	.....	29 34
Hay Creek, Oreg	D. W. Baldwin	July 9, 1882	do	25 25	.....	25 25
Hallsville, N. C	Edward Armstrong	Mar. 3, 1883	do	16 50	.....	16 50
Homer, La	D. W. Harris	July 27, 1882	Lost in transit	.....	74 00	74 00
Hillsborough, Wis	Thomas J. Shear	Nov. 4, 1883	Fire	71 00	.....	71 00
Houghton, Wash	James Curtis	July 22, 1882	do	19 68	.....	19 68
Humboldt, Tenn	W. H. Stilwell	Nov. 16, 1883	Lost in transit	.....	100 00	100 00
Howell, Dak	George W. Sayles	Sep. 7, 1883	Burglary	11 00	.....	11 00
Horace, Tenn	A. Gibson	May 21, 1882	Fire	2 75	.....	2 75
Hess Road Station, N. Y	E. P. Haynes	Aug. 24, 1881	Burglary	55 77	.....	55 77
Industry, Ill	J. W. Cordell	June 30, 1883	do	.....	100 81	100 81
Indian Spring, Ga	B. W. Collier	Apr. 18, 1883	Fire	51 89	.....	51 89
Isabella, Ga	C. G. Tipton	Jan. 26, 1879	do	4 50	.....	4 50
Indian Head, Pa	H. L. Sparks	Feb. 28, 1879	Burglary	6 00	.....	6 00
Jacksonville, Ark	Austin Bartlett	Feb. 15, 1882	do	10 00	.....	10 00
Junction City, Ohio	George Wolf	May 9, 1877	do	110 00	.....	110 00
Janesville, Iowa	William H. Rich	Oct. 16, 1872	do	45 00	.....	45 00
Jonesburgh, Mo	T. H. Hess	June 27, 1883	do	21 50	.....	21 50
Jacksonville, Oreg	Max Müller	Jan. 1, 1884	Fire	388 31	100 00	488 21
Jerusalem, Ohio	James C. Gatchell	June 23, 1882	do	40 13	.....	40 13
Johnsonsburgh, N. Y	Lester H. Tozier	Dec. 2, 1883	Burglary	93 75	.....	93 75
Jonesville, Ill	C. P. R. Rodgers	Mar. 2, 1881	do	8 00	.....	8 00
Jonesville, N. Y	C. A. Reade	Aug. 30, 1882	Fire	7 67	.....	7 67
Jimes, N. C	Henry H. Conrad	July 7, 1883	Burglary	5 50	.....	5 50
Kingston, Wis	E. G. Boynton	Sept. 21, 1883	do	53 14	.....	53 14
Kahoka, Mo	Mary A. Bishop	June 18, 1883	Lost in transit	.....	5 00	5 00
Kyte River, Ill	Albert Bailey	July 11, 1876	Burglary	15 44	.....	15 44

‡ Transmitted to Speaker of House of Representatives with recommendation for allowance of $2,300.

EXHIBIT B—Continued.

Post-offices.	Postmasters.	Date of loss.	Cause of loss.	Amount allowed.		
				Stamps.	Money-order funds.	Total.
Kokomo, Colo	D. T. Mitchell	Aug. 9, 1883	Lost in transit	.....	$46 00	$46 00
Kendallville, Ind	Charles O. Myers	June 9, 1876	Burglary	$244 00	147 33	391 33
Do	....do	Dec. 27, 1876	....do	.....	226 59	226 59
Kingston, Ind	S. R. Stewart	May 16, 1884	....do	22 87	.....	22 87
Key, Ga	M. E. Grover	Feb. 5, 1883	Fire	15 87	.....	15 87
Kerr's Station, Pa	William Pease	May 6, 1884	....do	8 17	.....	8 17
Kingsville, Ohio	J. H. Kinnear	July 22, 1867	Burglary	160 00	.....	160 00
Kenton, Miss	R. H. McNeely	Nov. 16, 1883	Lost in transit	.....	183 00	183 00
Lebanon, Tenn	Edgar Waters	July 28, 1881	Fire	108 50	.....	108 50
Lyons, Ohio	C. E. Carmon	June 21, 1881	Burglary	82 44	.....	82 44
Lewis, Nev	D. Cozzens	Dec. 5, 1881	Fire	117 72	.....	117 72
Lee's Creek, Ohio	C. B. Pidgeon	Aug. 6, 1881	....do	13 51	.....	13 51
Lisbon, Mich	Charles E. Koon	Aug. 27, 1880	Burglary	109 71	.....	109 71
Little Falls, N. Y	A. H. Greene	July 26, 1883	....do	1, 399 41	59 09	1, 458 50
Lowell, Wis	P. Rhienhart	July 2, 1881	....do	83 52	.....	83 52
Lee, Mass	J. C. Chaffee	Sept. 28, 1883	....do	25 01	26 80	51 81
Leiter's Ford, Ind	Daniel Biddinger	June 30, 1883	....do	27 00	.....	27 00
Lynn, Ind	Wm. R. Halliday	Oct. 5, 1883	....do	53 86	.....	53 86
Little River, S. C	J. W. Vereen	Sept. 4, 1875	Fire	15 70	.....	15 70
Linton, Ind	W. F. Cornelius	Feb. 1, 1883	....do	54 50	.....	54 50
La Harpe, Kans	E. L. Hackney	Feb. 26, 1883	Burglary	3 31	.....	3 31
Libertyville, Ill	E. W. Parkhurst	Oct. 29, 1874	....do	80 00	.....	80 00
Do	Isaac Heath	Feb. 2, 1884	....do	20 00	.....	20 00
Louisiana, Mo	W. H. Purse	Jan. 18, 1884	....do	83 69	.....	83 69
La Fox, Ill	L. M. Potter	Mar. 20, 1867	....do	30 00	.....	30 00
Liter, Ill	P. H. Rucker	May 18, 1883	Cyclone	66 84	.....	66 84
Laurel, Ohio	John L. Barkley	Feb. 19, 1884	Fire	30 06	.....	30 06
Lucy, Tenn	C. M. Black	Dec. 31, 1883	Burglary	26 00	.....	26 00
Langston, Ala	Silas Smith	Sept. 5, 1882	....do	19 35	.....	19 35
Lyons, Nebr	Franklin Everett	May 26, 1883	....do	156 30	.....	156 30
Little Sandusky, Ohio	James Whitaker	Apr. 9, 1884	....do	14 00	.....	14 00
Luverne, Minn	Charles O. Hawes	May 16, 1884	....do	.....	94 00	94 00
Lompoc, Cal	B. F. Tucker	Dec. 7, 1883	Lost in transit	.....	200 00	200 00
Lane, Kans	James A. Miles	Mar. 29, 1884	Burglary	.....	157 97	157 97
Little Falls, Minn	Lewis G. Worthington	May 10, 1884	....do	77 25	.....	77 25
Lansing, Iowa	James Ruth	May 19, 1884	....do	15 00	10 75	25 75
Laconia, Ark	C. H. Blackburn	Feb. 21, 1884	Fire	23 49	.....	23 49
Laudersville, Ind	Z. Stephenson	Nov. 16, 1882	Burglary	9 30	.....	9 30
Leonard, Ky	W. R. Bailey	Feb. 26, 1880	Fire	8 74	.....	8 74
La Porte, Cal	H. Washington	Aug. 5, 1884	....do	71 13	.....	71 13

Markland, Ind	Gen. Clendenning	Apr. 8, 1883	do	38 15		38 15
Metamora, Ind	James Dowdy	May 18, 1882	Burglary	33 80	10 12	43 92
Mill, Iowa	N. W. Spears	May 6, 1882	do	30 00		30 00
Miltonvale, Kans	W. T. Matthews	July 8, 1883	Fire	7 00		7 00
Mount Airy, Md	John C. Duvall	Oct. 10, 1881	Burglary	48 00		48 00
Mitchell, Ind	Samuel Cook	Oct. 6, 1876	do	15 10		15 10
Marlin's Bottom, West Va	J. R. Apperson	Mar. 3, 1883	Fire	57 69		57 69
Monteith, Iowa	L. Reed	Dec. 25, 1883	do	43 76		43 76
Medford, Minn	John Bailey	Aug. 17, 1883	Burglary	143 17	3 85	147 02
Milford, Ind	C. C. Reynolds	Apl. 22, 1875	do	165 00		165 00
Murphy, N. C	T. C. Dickey	Oct. 27, 1881	Fire	25 58		25 58
Maplewood, Ill	John McKean	Sept. 10, 1881	Burglary	7 97		7 97
Monticello, N. Y	R. Oakley	Mar. 14, 1883	do	8 12		8 12
Montrose, Mo	J. K. Whitehead	June 14, 1882	Fire	106 19		106 19
Milton, Wis	W. P. Clarke	Nov. 20, 1882	Burglary		188 40	188 40
Mifflin, Tenn	C. R. Scarborough	Mar. 9, 1884	Burglary or fire	2 59		2 59
Madonnaville, Ill	G. W. Harbaugh	May 18, 1874	Burglary	55 14		55 14
Montserrat, Mo	Joseph R. Benham	Aug. 1, 1883	Fire	21 63		21 63
McKee's Half Falls, Pa	W. P. Hilbish	Nov. 7, 1880	Burglary	56 36		56 36
Midland, Mich	Benjamin F. Bradley	Dec. 17, 1883	do	90 28	177 62	267 90
Mount Olive, Miss	Joseph Gilbert	Apr. 22, 1882	Storm	2 52		2 52
Mount Adams, Ark	N. B. Price	Dec. 14, 1879	Fire	15 00		15 00
Middlebury, Ind	Moses A. Cardrey	Apr. 10, 1883	Burglary	72 40	19 83	92 23
Mill Shoals, Ill	O. P. Scudder	June 25, 1883	Fire	5 75		5 75
Macon, Miss	R. Stewart	Nov. 22, 1879	do†			
Monticello, Miss	K. C. Pepper	Apr. 22, 1882	Cyclone	26 16		26 16
McCondy, Miss	J. W. McCoudy	Mar. 2, 1884	Fire	7 80		7 80
Madrid, Me	Isaiah Chick	Oct. 21, 1883	do	38 47		38 47
Meriweather, Ga	B. H. Myrick	May 6, 1884	do	3 26		3 26
Meriden, Kan	R. E. Gillenly	Dec. 30, 1883	Burglary	102 41	27 67	130 08
Mona, Iowa	H. Alexander	Mar. 27, 1883	Fire	142 08		142 08
Mantz, Pa	Jacob Mantz	May 18, 1884	Burglary	19 07		19 07
McClellan Gulch, Mont	Charles Pryse	Dec. 29, 1880	Fire	43 50		43 50
Manchester, Md	E. A. Ganter	Feb. 22, 1884	Lost in transit		15 00	15 00
Moselle, Mo	William F. Drake	July 14, 1884	Burglary	14 65		14 65
Nortonville, Kans	C. C. McCarthy	May 30, 1881	do		46 41	46 41
Northside, Nebr	Warner Starr	June 14, 1883	Fire	8 07		8 07
*New Hartford, N. Y	Mrs. A. M. Palmer	July 22, 1878	Burglary	73 00		73 00
Nimshew, Cal	S. McClellan	July 17, 1881	Fire	49 38		49 38
Neah Bay, Wash	E. Gallick	Sept. 5, 1882	do	30 95		30 95
Northumberland, N. H	R. L. Adams	June 1, 1875	Burglary	40 00		40 00
North Aurora, Ill	C. Pierce	Apr. 13, 1878	do	14 73		14 73
North Wilton, Conn	James Comstock	Apr. 18, 1883	do	43 95		43 95
New Richmond, Ind	J. W. Hollins	May 15, 1883	Fire	79 39		79 39
New Corydon, Ind	W. H. Reed	Nov. 16, 1875	Burglary	25 52		25 52
Nabb, Ind	J. O. Taflinger	Mar. 29, 1882	Fire	30 00		30 00
New Auburn, Minn	P. Wilkins	Oct. 2, 1877	do	95 95		95 95
Neuse, N. C	George E. Hunter	Nov. 11, 1882	Burglary	16 56		16 56
New Hamburgh, N. Y	W. G. Ferris	Aug. 2, 1876	do	45 10		45 10

† Referred to auditor Post-Office Department for credit under provisions of section 409, Revised Statutes.

EXHIBIT A—Continued.

Post-offices.	Postmasters.	Date of loss.	Cause of loss.	Amount allowed.		
				Stamps.	Money-order funds.	Total.
North Dorr, Mich	Jacob Bartz	Feb. 28, 1884	Fire	$7 93		$7 93
North Evans, N. Y	W. S. Sikes	July 16, 1878	Burglary	71 17		71 17
Neury, N. J	Sylvester Contini	Apr. 13, 1883	Fire	3 00		3 00
New London, Ind	W. L. Newlin	Jan. 5, 1884	Burglary	49 46		49 46
New Gascony, Ark	J. M. Gracie	Feb. 19, 1884	Flood	10 78		10 78
New Baden, Ill	Henry Hummel	May 28, 1884	Fire	28 19		28 19
Nauvoo, Ill	Robert Aitchison	June 1, 1883	Burglary	41 73		41 70
Ostrander, O	Abner Said	Mar. 23, 1880	do	53 40		53 43
Oberlin, O	E. J. Phillips	May 2, 1882	dot			
Orlinda, Mo	C. W. Johnson	May 13, 1882	Fire	9 11		9 11
Oakfield, N. Y	J. T. Tilley	Aug. 22, 1883	do	18 56		18 56
Oskaloosa, Iowa	C. Leighton	Oct. 3, 1883	Burglary	413 30	$24 74	438 04
Old Chatham, N. Y	Samuel Wilbor	May 21, 1882	do	39 47		39 47
Olmstead, Ill	G. W. Higgins	Apr. 10, 1883	Fire	52 81		52 81
Osceola Mills, Wis	Stephen Rowcliff	Sept. 7, 1883	Burglary	46 00	50 41	96 41
Opdyke, Ill	H. Cornelius	May 15, 1877	do	34 00		34 00
Odessa, Mo	Milton V. Powell	Mar. 5, 1884	Fire	30 76		30 76
Oneonta, N. Y	Carey B. Pepper	May 2, 1881	Burglary	827 46	262 72	1,090 18
Oakland Mills, Iowa	N. E. Armstrong	Nov. 27, 1882	do	16 97		16 97
Ontario, N. Y	Russell Johnson	Nov. 11, 1880	do	52 00		52 00
Oak Point, Ill	D. Baughman	May 24, 1877	do	11 56		11 56
Ochlochnee, Ga	R. W. Basten	Jan. 27, 1884	Fire	11 24		11 24
Otto, N. Y	W. E. Hunt	Apr. 7, 1878	Burglary	57 23		57 23
O'Neill, Nebr	W. D. Mathews	Mar. 2, 1884	Fire	81 48		81 48
Otisville, Mich	Mary E. Lansfield	June 3, 1884	Burglary	24 70		24 70
Oil City, Wis	George Butler	Dec. 16, 1882	Fire	6 33		6 33
Oxford, N. J	E. T. Lukens	Feb. 2, 1882	do	84 12		84 12
Pottersburgh, Ohio	Jonas Cline	Nov. 15, 1880	Burglary	34 77		34 77
Peak, S. C	A. J. Counts	July 8, 1882	Fire	88 79		88 79
Pratt, Minn	W. C. Lieb	July 15, 1883	do	5 00		5 00
Providence, Miss	J. S. King	Feb. 13, 1881	do	4 94		4 94
Philanthropy, Ohio	John L. Phillis	Jan. 8, 1881	Burglary	24 30		24 30
Pataskala, Ohio	W. C. Elliott	May 3, 1881	do		122 17	122 17
Plate Cañon, Colo	A. A. St. Laurent	Aug. 2, 1882	Fire	23 66		23 66
Pottsville, Pa	Elizabeth H. Sillyman	Nov. 23, 1883	Burglary	401 09		401 09
Pinckneyville, Ill	R. Q. Thompson	May 4, 1880	do	18 01		18 01
Do	do	Apr. 29, 1881	do	56 40		56 40
Pickett, Wis	F. S. Newell	Nov. 14, 1883	Fire	3 76		3 76
Perry, Ill	Mary E. Fifield	Oct. 15, 1878	Burglary	8 50		8 50
Pequanac, N. J	J. Van Cleef	Dec. 27, 1882	do	11 54		11 54

Perry, Kans	J. R. Martin	Dec. 23, 1883	do	96 93	145 16	242 09
Patriot, Ind	L. North	Mar. 28, 1867	do	120 29		120 29
Penfield, Pa	C. H. Coryell	Sept. 8, 1882	do	88 65		88 65
Parrish, Ill	F. P. Reagin	Oct. 28, 1883	do	21 50		21 50
Paden's Valley, W. Va	S. S. Price	Feb. 27, 1884	Fire	3 45		3 45
Pleasant Valley, Wis	H. R. Morgan	Oct. 4, 1883	Burglary	24 18		24 18
Plainville, N. Y	Thomas McCall	Feb. 27, 1884	do	56 00		56 00
Phelps, N. Y	S. S. Partridge	Feb. 26, 1882	do	66 35		66 35
Pine Valley, N. Y	W. C. Palmer	May 17, 1883	do	17 77		17 77
Paines, Mich	H. W. Stewart	Feb. 4, 1883	Fire	58 55		58 55
Pisgah, Ohio	S. M. Sprinkle	May 17, 1879	Burglary	25 00		25 00
Pearl, Pa	M. Z. Hovis	Aug. 1, 1882	Fire	13 00		13 00
Petersburgh, Ind	Miss Mary M. Glezin	Dec. 10, 1882	do	100 00		100 00
Peekskill, N. Y	Joseph Hudson	Oct. 20, 1881	Burglary	1,070 40	30 00	1,100 40
Potomac, Ill	C. E. Pressey	Sept. 20, 1880	Fire	8 91		8 91
Parksville, N. Y	T. Crary	Aug. 20, 1878	Burglary	128 42		128 42
Press, Ala	Press Chaney	Aug. 25, 1883	Burglary	4 00		4 00
Plano, Cal	Wm. Thompson	May 17, 1884	Fire	157 48		157 48
Pine Grove, Ky	T. H. Johns	May 16, 1884	do	31 05		31 05
Perkinsville, N. Y	Stephen Bricks	June 20, 1884	Burglary	19 75		19 75
Pasadena, Cal	Romayne Williams	Apr. 6, 1884	do		312 54	312 54
Panacea Springs, N. C	T. W. Harris	Nov. 18, 1883	Fire	33 29		33 29
*Pittsborough, N. C	Mrs. M. A. Y. Palmer	June 12, 1884	Lost in transit		20 00	20 00
Russell's Mills, Ind	J. C. Ward	May 4, 1883	Burglary	4 70		4 70
Rushville, Mo	E. Watson	June 14, 1877	do	9 25		9 25
Ripon, Wis	H. S. Town	Feb. 7, 1879	Fire		425 55	425 55
Riverton, Miss	I. H. Duncan	Mar. 1, 1882	Flood	16 00		16 00
Red Cliff, Colo	H. W. Pollitz	Aug. 10, 1883	Stolen in transit		240 00	240 00
Rockville, Va	F. J. Bowles	Sept. 1, 1883	Fire	8 64		8 64
Rahway, N. J	C. A. Oliver	Oct. 7, 1879	Burglary	125 58		125 58
Do	S. M. Oliver	Feb. 26, 1881	do	264 39		264 39
Ray's Mills, Ga	H. H. Knight	Dec. 7, 1882	Fire	34 36		34 36
Rich Hill, Mo	George P. Huckeby	Feb. 24, 1884	Burglary	376 84	144 00	520 84
Richards, Ind	Lewis M. Fritch	May 12, 1883	do	4 25		4 25
Rigdon, Ind	Ruben Patrick	Jan. 9, 1884	do	45 19		45 19
Robinson, Colo	A. Pahl	Aug. 10, 1883	Stolen in transit		172 00	172 00
Red Creek, N. Y	Jacob D. Covert	Mar. 27, 1884	Fire	22 05		22 05
Rives Junction, Mich	H. K. Wood	Oct. 17, 1882	Burglary	36 00		36 00
Red Creek, N. Y	Jacob D. Covert	Mar. 27, 1884	Fire	33 70		33 70
Ravenswood, Ill	W. H. Bryan	Feb. 14, 1877	Burglary	10 00		10 00
Rutherfordton, N. C	M. M. Scroggin	Dec. 22, 1880	Lost in transit		15 00	15 00
Rappahannock Academy, Va	C. B. Thornton	Nov. 5, 1872	Fire	6 21		6 21
Ringgold, Ga	L. A. Knapp	Jan. 30, 1884	Burglary	164 70		164 70
Roscoe, Iowa	L. C. Hall	Oct. 26, 1883	Fire	11 34		11 34
Ravanna, Mo	A. Bruse	Aug. 13, 1879	Burglary	59 00		59 00
Riverside, Mass	W. G. Johnson	May 12, 1884	Fire	7 12		7 12
Riverside, Iowa	D. W. Ott	June 12, 1883	Burglary	93 00	25 65	118 65
Royston, Ark	John Matlock	Feb. 29, 1884	Fire	49 49		49 49
Rock Creek, Ark	S. P. Baker	Dec. 9, 1882	do	19 37		19 37
Riverside, Me	G. L. Randall	July 16, 1879	Burglary	23 00		23 00

† Transmitted papers to Speaker of the House of Representatives, with recommendation of allowance of $277.25 for money order funds and $1,837.64 for stamps.

EXHIBIT A—Continued.

Post-offices.	Postmasters.	Date of loss.	Cause of loss.	Amount allowed.		
				Stamps.	Money-order funds.	Total.
Rixford, Pa	H. G. Allen	Nov. 26, 1883	Fire	$3 30	$28 23	$31 53
Southwick, Mass	J. W. Rockwell	May 25, 1883	Burglary	25 32	.....	25 32
Saint Oloff, Minn	O. O. Vinge	May 25, 1883	Fire	10 50	.....	10 50
Sand Cut, Pa	S. H. Rhodes	Oct. 31, 1881	Burglary	70 00	.....	70 00
Sherborn, Mass	George H. Bullard	Mar. 13, 1881	... do	7 00	.....	7 00
Saint Mark's, Fla	J. W. Adams, jr	Sept. 9, 1882	Flood	44 40	.....	44 40
Snowdown, Ala	W. J. Davis	May 14, 1883	Fire	30 00	.....	30 00
Sylvania, Ind	Wm. B. Gillum	Feb. 16, 1883	....do	45 67	.....	45 67
Simpson's Creek, W. Va	N. L. Bartlett	Sept. 12, 1883	Burglary	8 79	.....	8 79
Sultan, W. Va	M. Mustoe	Nov. 25, 1882	Fire	15 99	.....	15 99
Sherwood, Mich	M. E. Sawin	Apr. 27, 1883	Burglary	82 28	45 00	127 28
Sandy Hill, N. Y	J. E. Locke	Apr. 12, 1882	....do	82 00	.....	82 00
Sabbot Island, Va	W. W. Wright	Nov. 6, 1882	Fire	110 15	.....	110 15
Suffield, Conn	F. H. Reid	Apr. 23, 1883	Burglary	50 00	.....	50 00
Southford, Conn	Horace Oatman	Oct. 12, 1882	..... do	29 36	.....	29 36
Saugatuck, Conn	James E. Hubbell	May 21, 1883	.....do	16 50	.....	16 50
Star, Wis	C. W. Lawton	Oct. 31, 1882	Fire	12 22	.....	12 22
South Elliott, Me	E. Brooks	June 30, 1881	.....do	50 13	.....	50 13
Scarsdale, N. Y	George N. Ullman	Mar. 3, 1882	Burglary	41 58	.....	41 58
Saint Charles, La	A. Morales	Apr. 28, 1872	Fire	2 86	.....	2 86
Sodus, N. Y	L. M. Gaylord	July 27, 1883	Burglary	109 38	.....	109 38
Springfield, Ill	J. T. S. Linn	Dec. 5, 1881	.....do	11 36	.....	11 36
Summitville, Mo	H. Hawkins	Feb. 4, 1883	Fire	5 00	.....	5 00
Starkville, Miss	Maria T. Sullivan	Aug. 24, 1883	.....do	13 34	.....	13 34
Sand Bank, N. Y	Aaron Fuller	Feb. 15, 1884	Burglary	.....	51 59	51 59
South Salem, N. Y	C. Lawrence	July 20, 1876	.....do	60 00	.....	60 00
Saint Charles, Mich	E. A. Stinson	Dec. 29, 1883	Lost in transit	.....	5 00	5 00
Sugar Grove, Ind	George P. Haines	Jan. 23, 1884	Fire	11 60	.....	11 60
Steele, Dak	Frederick C. Barkman	Mar. 27, 1884	.....do	40 50	.....	40 50
Sulphur Springs, Kans	Thomas Cartwright	Dec. 23, 1883	.....do	21 20	.....	21 20
Sleepy Creek Bridge, W. Va	J. H. Shackelford	Aug. 7, 1882	Burglary	26 76	.....	26 76
Sumner, Mich	Edward L. Drake	Oct. 18, 1883	.....do	30 44	.....	30 44
South Bethlehem, N. Y	John A. Sager	Mar. 27, 1884	..... do	18 42	.....	18 42
Sterling, N. Y	Frances V. Hudson	Aug. 20, 1881	..... do	64 66	.....	64 66
Springerton, Ill	John W. Springer	Dec. 31, 1883	.....do	31 58	.....	31 58
Southampton, N. Y	H. F. Herrick	Sept. 28, 1883	.....do	133 00	.....	133 00
Summit, Miss	F. W. Collins	Jan. 4, 1881	Lost in transit	.....	20 00	20 00
Saranac, Mich	Mrs. L. M. Cotton	June 13, 1884	Burglary	.....	48 61	48 61
Stanton, Ind	Albert Webster	Oct. 2, 1883	.....do	39 05	.....	39 05
Saint Peters, Mo	B. Weinerth	Mar. 27, 1884	.....do	8 00	.....	8 00

Stewartsville, N. J.	Alvah R. Kase	Jan. 25, 1876	....do	29 00		29 00
Searsville, N. Y	S. A. Comfort	Dec. 29, 1883	....do	4 29		4 29
Savannah, Tenn	N. T. McDaniel	Nov. 14, 1883	Lost in transit		617 00	617 00
South Royalton, Vt	Charles C. Southgate	Aug. 29, 1884	Burglary	83 47	86	84 33
Saint James, N. Y	Harriet Smith	Dec. 7, 1880	....do	32 11		32 11
Seneca, S. C	Alexander Ramsey	May 4, 1883	Fire	81 33		81 33
Tulare, Cal	J. M. Johnson	July 29, 1883	....do	86 92		86 92
Tehama, Cal	E. F. Wade	Sept. 24, 1883	....do	39 50		39 50
Thomaston, Conn	E. T. Gates	Nov. 17, 1868	Burglary	300 00		300 00
Do	....do	July 5, 1878	Fire	87 92		87 92
Temascal, Cal	Mrs. Margie Matheson	Dec. 10, 1883	....do	15 25		15 25
Taylorsville, Ga	George W. Peacock	Oct. 22, 1881	....do	25 00		25 00
*Tonawanda, N. Y.	Robert L. Koch	Mar. 18, 1882	Burglary	70 00		70 00
Talbot, Mich	Frederick W. Sensiba	Dec. 2, 1883	Fire	11 50		11 50
Twin Mound, Kans	Henry Hiatt	Jan. 2, 1881	....do	25 65		25 65
Twiggsville, Ga	J. S. Evans	Aug. 26, 1882	....do	15 00		15 00
Do	H. J. Newby	Jan. 29, 1884	....do	12 82		12 82
The Rock, Ga	James R. Black	Nov. 3, 1883	....do	18 00		18 00
Thomas, Pa	J. M. Thomas	June 18, 1884	Burglary	25 69		25 69
Talledora, Miss	S. H. Peacock	Mar. 9, 1882	Fire	48 33		48 33
Trenton, Ohio	J. Eicher	May 28, 1884	Burglary	88 39		88 39
Toronto, Iowa	G. W. Thorn	Feb. 23, 1878	....do	25 00		25 00
Do	....do	June 18, 1879	....do	15 00		15 00
Thorntown, Ind	John L. Smith	Nov. 22, 1883	....do	9 21		9 21
Tupelo, Miss	J. A. Blair	Nov. 16, 1883	Lost in transit		60 00	60 00
Upland, Ind	Tremont N. Haines	Jan. 31, 1884	Burglary	27 43		27 43
Union Springs, N. Y	Manson F. Backus	Oct. 28, 1883	Fire	8 65		8 65
Upland, Ind	Tremont N. Haines	Jan. 31, 1884	Burglary	12 57		12 57
Uniontown, Ala	J. H. Houston	Feb. 21, 1884	Fire	50 04		50 04
Utica, Mo	Cyrus A. McCloughan	May 2, 1884	....do	109 90		109 90
Uniontown, Pa	Arin J. Sturgis	Apr. 30, 1884	Burglary	127 85	36 50	164 35
Unison, Va	Texanna Swaim	Sept. 19, 1884	Fire	14 29		14 29
Victoria, Ill	H. R. Olmsted	Nov. 1, 1881	Lost in transit		21 00	21 00
Vineyard Haven, Mass	George N. Peaks	Aug. 11, 1883	Fire	118 65		118 65
Vallena, Va	W. G. Staples	Aug. 12, 1883	Burglary	2 00		2 00
Valley Ford, Ohio	M. W. Tewksbury	Mar. 14, 1877	Fire	5 10		5 10
Vanlue, Ohio	Daniel Gilbert	Apr. 21, 1882	Burglary	37 85	14 00	51 85
Valley City, Dak	Christian Anderson	Mar. 21, 1884	Fire	98 64		98 64
Welch, Mo	J. C. Boulivare	Dec. 26, 1881	....do	18 27		18 27
Waverly Mills, Minn	Mrs. Salome Kyte	Mar. 13, 1883	....do	9 95		9 95
Whitesville, Ky	T. C. Floyd	July 11, 1883	Burglary	3 00		3 00
Wall Lake, Iowa	H. B. Allen	June 21, 1883	....do	51 55		51 55
Westminster, Ohio	J. A. Slemmons	Mar. 29, 1881	....do	25 80		25 80
*West Richfield, Ohio	H. C. Searles	Feb. 10, 1881	....do	147 60		147 60
West Hope, Ohio	L. C. Warner	Feb. 7, 1881	Fire	14 90		14 90
Walnut Grove, Mo	J. W. Smith	Mar. 3, 1883	Burglary	95 00		95 00
Waxahachie, Tex	G. J. Penn	Oct. 26, 1881	Stolen in transit		400 00	400 00
Wallaceville, Mich	J. B. Wallace	Nov. 16, 1883	Fire	20 32		20 32
West Stratford, Conn	L. B. Vaill	Mar. 19, 1883	Burglary	58 20		58 20
*Watertown, Conn	B. C. Atwood	Dec. 6, 1882	....do	250 49		250 49
Wither's Mills, Mo	J. Stover	May 4, 1879	....do	8 85		8 85
Whiting, Kans	F. M. Green	Oct. 31, 1883	....do	299 99		299 99

EXHIBIT A—Continued.

Post-offices.	Postmasters.	Date of loss.	Cause of loss.	Amount allowed.		
				Stamps.	Money-order funds.	Total.
Williams, Cal	P. B. Chamberlain	Nov. 19, 1883	Fire	$41 48		$41 48
Westcott, Minn	August Lan	Nov. 30, 1882	do	17 47		17 47
Washington, Kans	Philip Rochefeller	Jan. 17, 1884	do	80 94		80 94
White Oak Springs, Ala	John H. Blair	Oct. 22, 1883	do	7 58		7 58
Woodland, Ind	Frederick Weber	Sept. 24, 1883	Burglary	16 16		16 16
Waubeek, Wis	J. L. Perry	Mar. 24, 1883	Fire	5 00		5 00
Woodland, Mich	David B. Kilpatrick	Sept. 28, 1883	Burglary	35 09	$4 45	39 54
Williamsburgh, Ky	M. V. B. Sutton	Feb. 13, 1884	do	104 00		104 00
Weston, Oreg	L. S. Wood	Oct. 17, 1883	Fire	10 60		10 60
Whitewater, Wis	H. H. McGraw	Mar. 26, 1884	Burglary	62 65	31 60	94 25
Wadsworth, Nev	Edwin Fowler	Apr. 15, 1884	Fire	178 85		178 85
Windsor, Ind	J. L. Thornburg	May 7, 1883	do	3 43		3 43
Warren, N. H	J. S. Jewett	Dec. 31, 1881	Burglary		64 97	64 97
West Camden, N. Y	C. L. Morss	Nov. 21, 1881	do	26 59		26 59
Warwick, Mass	Abner Albee	Oct. 6, 1882	Fire	15 30		15 30
White Sulphur Springs, La	J. W. Moffett	Aug. 22, 1881	do	20 00		20 00
Wigginsville, Ohio	J. M. Milner	Dec. 19, 1883	Burglary	12 90		12 90
Warrensburgh, N. Y	M. N. Dickinson	Aug. 25, 1874	do	162 70		162 70
Windsor, Ind	J. L. Thornburg	May 7, 1883	Fire	7 16		7 16
Woodstock, Vt	J. H. Murdock	Aug. 14, 1883	Burglary	17 53		17 53
Woolstock, Iowa	Eliza E. Middleton	Feb 22, 1884	Fire	1 10		1 10
Windsor, Ohio	C. E. Leslie	Mar. 20, 1881	do	15 00		15 00
Williamsburgh, Ill	William White	July 6, 1882	do	25 53		25 53
Waynesville, Ga	J. W. Hatcher	Apr. 18, 1884	Lost in transit		91 00	91 00
Wayland, Mo	P. S. Stanley	Mar. 8, 1883	Fire	22 24		22 24
Woodstock, Wis	W. A. Bradshaw	June 6, 1876	Burglary	5 00		5 00
Winnebago, Nebr	C. J. O'Connor	Jan. 15, 1883	Fire	39 40		39 40
Winchendon, Mass	E. S. Merrill	Sept. 25, 1884	Burglary	133 89		133 89
Walnut, Mo	H. W. Miller	Feb. 10, 1884	Fire	36 00		36 00
Windsor, N. C	Henry W. Lyon	Aug. 7, 1883	Lost in transit		196 00	196 00
York, Mo	F. Greenley	Oct. 30, 1882	Fire	31 52		31 52
Yankeetown, Wis	J. M. Craigo	Feb. 4, 1875	do	8 90		8 90

EXHIBIT B.

[M. O. funds=money-order funds.]

Post-offices.	Postmasters.	Date of loss.	Character of loss.	Amount claimed.	Cause of loss and reasons for disallowance.
Austin, Nev	William Gibson	Oct. 16, 1874			Flood. Claim not filed within the time prescribed by law.
Do	do	Sept. 15, 1881			Fire. Claim not filed within the time prescribed by law.
Atlantic Highlands, N. J	P. G. Everett	July 23, 1883	Stamps	$23 00	Cyclone. Claim not filed within the time prescribed by law.
Augusta, Ky	Alexander Case	Feb. —, 1884	do	15 32	Flood. Claim not filed within the time prescribed by law.
Avena, Ill	H. W. Long	June 1, 1875	do	15 00 to 24 00	Burglary. Proper care not exercised.
Arbacoochie, Ala	W. M. Birchfield	July 11, 1877	do	7 00	Burglary. Evidence of loss unsatisfactory.
Aitken, Minn	Warren Potter	May 30, 1884	do	86 32	Burglary. Proper care not exercised.
Askew, Ark	F. E. Platon	Apr. 18, 1876	do	21 91	Fire. Evidence of loss unsatisfactory.
Blue Spring, Mo	C. W. Mock	Jan. 14, 1880	do	60 00	Burglary. Proper care not exercised.
Boyleston, Ill	D. G. Buis	July 23, 1883	do	57 92	Do.
Blount's Ferry, Fla	E. Brown	Feb. 2, 1882	do	15 00	Fire. Proper care not exercised.
Bonham, Tex	C. Krichenbarger	Aug. 29, 1878			Fire. Evidence of loss unsatisfactory.
Do	do	Dec. 13, 1879			Do.
Blue Mound, Mo	Lewis Johnson	June 20, 1883	Stamps	5 23	Tornado. Claim withdrawn.
*Boonton, N. J	E. B. Dawson	Oct. 24, 1879	do	7 83	Burglary. Proper care not exercised.
Brookville, Wis	John Garehart	Dec. 29, 1872	do	54 60	Fire. Evidence of amount of loss unsatisfactory.
Barr's Landing, S. C	F. W. Oswalt	Nov. 14, 1883	do	14 61	Fire. Proper care not exercised.
Ballston, N. Y	M. J. Esmond	May 12, 1883	do	88 73	Burglary. Proper care not exercised.
Beaver, Utah	J. S. McMillan	Nov. 21, 1883	M. O. funds	579 00	Lost in transit. Evidence of loss unsatisfactory.
Brookville, Ohio	Levi Baker	June 21, 1883	Stamps	45 00	Burglary. Proper care not exercised.
Booneville, Miss	R. S. Stanley	Nov. 16, 1883	M. O. funds	88 00	Burned in transit. Claim not filed within the time prescribed by act of March 17, 1882.
Black Hawk, La	B. B. Lehman	Nov. 14, 1883			Fire. Proper care not exercised.
Burlington, Kans	G. W. Doty	Feb. 5, 1884	M. O. funds	40 00	Lost in transit. Claim withdrawn. Money recovered.
Baltic, Ohio	C. Lenz	Dec. 26, 1883			Burglary. Loss postal funds, $87.41.
Buckland, Conn	Hollis G. Parker	Mar. 8, 1884	Stamps	103 50	Larceny and fire. Proper care not exercised.
Bethalto, Ill	W. L. Riggott	Sept. 11, 1877	do	15 00	Burglary. Evidence of loss unsatisfactory.
Bruce, Miss	D. J. Austin	June 19, 1880	do	56 50	Fire. Proper care not exercised.
Barclay, Ill	H. R. Stevenson	May 30, 1878	do	45 13	Burglary. Proper care not exercised.
Bonne Terre, Mo	C. B. Parsons	Feb. 21, 1884	M. O. funds	99 14	Do.
Bay View, Wis	J. Parkes	Mar. 18, 1884	do	179 00	Do.
Bowerstown, Ohio	W. B. Penn	Apr. 28, 1882	Stamps	3 00	Do.
Brooklyn, Conn	Lewis Searls	Apr. 17, 1884	do	186 55	Do.
Biler, Ala	James A. Henson	Apr. 22, 1884	All on hand		Storm. Claim not filed within the time prescribed by law.
Baird, Tex	Philip Schwartz	Jan. 8, 1884	M. O. funds	88 49	Burglary. Claim not filed within the time prescribed by law.
Bluff City, Ky	S. E. Crawley	May 5, 1883	Stamps	Not stated	Fire. Evidence of loss unsatisfactory.
Bloomingburg, Ohio	Joseph Y. Stitt	July 24, 1884	do	128 00	Burglary. Proper care not exercised.
Belmont, Miss	William T. Clark	July 10, 1883	do	14 00	Fire. Proper care not exercised.
Boyne, Mich	P. A. Badour	Aug. 30, 1884	M. O. funds	10 00	Lost in transit. Evidence of loss unsatisfactory.
Chatham, Pa	C. H. Kimball	Sept. 16, 1883			Burglary. Loss postal funds, $18.
Chatsworth, Ill	N. C. Kenyon	Aug. 29, 1881	M. O. funds	125 81	Burglary. Evidence of loss unsatisfactory.
Do	do	Aug. 29, 1881	Stamps	327 50	Do.

EXHIBIT B—Continued.

Post-offices.	Postmasters.	Date of loss.	Character of loss.	Amount claimed.	Cause of loss, and reasons for disallowance.
Craftsbury, Vt	James D. Leavitt	Dec. 14, 1883	Stamps	$10 63	Fire. Evidence of loss unsatisfactory.
Chemung, N. Y	Charles Ruggles	Aug. 10, 1883	do	22 00	Do.
*Carbonateville, Colo	D. J. Chadwick	Nov. 26, 1879	do	447 03	Fire. Loss, if any occurred, the result of negligence.
Do	do	Nov. 26, 1879	M. O. funds	336 19	Do.
Clayton, Ala	J. C. Flourney	Nov. 6, 1883	do	10 00	Lost in transit. No evidence of loss.
Capleville, Tenn	William J. Abston		Stamps	3 26	Destroyed by mice. Not within the provisions of the law.
Clinton, N. C	J. E. Barden	July 17, 1883	M. O. funds	20 00	Lost in transit. Evidence unsatisfactory.
Chapel Hill, N. J.	A. C. Watrous	Oct. —, 1875	Stamps	12 00	Burglary. Evidence unsatisfactory.
Carpentersville, Ind	W. F. Garver	June 19, 1883	do	7 00	Fire. Evidence of loss unsatisfactory.
Coushatta, La	J. R. McGaldrick	Sept. 28, 1883	M. O. funds	77 00	Stolen in transit. Failure to comply with Sec. 1099 P. L. and R.
Cannon, Tex	William A. Dean	Mar. 17, 1884	Stamps	40 62	Fire. Claim not presented within the time prescribed by law.
Cherry Fork, Ohio	John A. Allison	Feb. 19, 1883	do	16 10	Burglary. Claim not presented within the time prescribed by law.
Crow Wing, Minn	Jessie B. Sibley	Sept. 25, 1883	do	15 00	Fire. Evidence of loss unsatisfactory.
Crawford, Fla	W. R. Crawford	June 10, 1884	do	1 85	Burglary. Evidence of loss unsatisfactory.
Cresswell, Nebr	Henry N. Merrill	Jan. 1, 1884	do	15 00	Fire. Claim not presented within the time prescribed by law.
Ceralvo, Ky	Samuel P. Bennett	Nov. 10, 1883	do	60 00	Fire. Evidence of loss unsatisfactory.
Collinsville, Conn	E. A. Hough	Apr. 5, 1884	M O. funds	80 00	Burglary. Proper care not exercised.
Cedartown, Ga	William C. Knight	Jan. 14, 1884	do	89 18	Do.
Colfax, N. C	D. L. Gray	July 25, 1882	Stamps	56 03	Fire. Evidence of loss unsatisfactory.
Centralia, Ill	Hiram W. Hubbard	Oct. 23, 1884	do	640 00	Larceny. Not within the provisions of the law.
Calo, Iowa	M. J. Hauks	Mar. 31, 1873	do	44 00	Burglary. Proper care not exercised.
Corinth, Vt	C. C. Sargent	June 18, 1884	do	21 00	Burglary. Claim not presented within the time prescribed by law.
Darlington, Mo	A. T. Pringle	Mar 17, 1882	do	45 00	Burglary. Proper care not exercised.
Dardanelle, Ark	M. Jessup	Dec. 20, 1882	do	Not known	Fire. Proper care not exercised.
Delphi, Ind	J. M. Watts	Mar. 15, 1881	M. O. funds	100 00	Lost in transit. Failure to comply with P. L. and R. in remittance.
Dungannon, Ohio	J. Hagan	Oct. 1, 1878	Stamps	11 87	Fire. Proper care not exercised.
Dick, Miss	I. N. Gray	Mar. —, 1883		Not stated	Fire Claim not presented in the time prescribed by law.
Denmark, Ind	William Herstine	June 12, 1883			Burglary. Loss postal funds, $6.05.
Dawson, Dak	Charles S. Aiken	July 25, 1883	Stamps	20 50	Fire. Claim withdrawn.
Drywood, Mich	Walter J. McKay	Dec. 3, 1883	do	5 63	Fire. Evidence of loss unsatisfactory.
Dry Fork Depot, Va	T. C. Jones	Apr. 27, 1884	do	5 75	Fire. Claim not filed within the time prescribed by law.
Dakota, Nebr	M. O. Ayers	Feb. 21, 1884	do	128 00	Burglary. Proper care not exercised.
Do	do	Feb. 21, 1884	M. O. funds	1 50	Do.
Delphi, Ind	Jehu C. Hannum	Dec. 17, 1867	Stamps	135 00	Do.
Deep Creek, Va	J. M. Johnson	Sept. 9, 1883		All on hand	Fire. Claim not filed within the time prescribed by law.
Dallas, Ill	B. Mendenhall	Mar. 7, 1877			Lost in transit. Loss $5, postal funds. Not within the provisions of the law.
Edinburgh, Ill	Daniel Decamp	Feb. 1, 1883	Stamps	32 90	Fire. Evidence of loss unsatisfactory.
Eden, Ky	J. Williamson	July 3, 1875			Do.
Eagle Rock, Pa	P. Masterson	Oct. 13, 1877			Burglary. Evidence of loss unsatisfactory.
East Pepperell, Mass	G. W. Stevens	1876			Do.
Elgin, Ohio	S. F. Ross				Do.
Edwardsville, N. Y	J. E. De Mott	Apr. 23, 1882			Fire. Evidence of loss unsatisfactory.
Eugene, Ill	D. B. Jones	1877	Stamps	5 00	Do.

East Salem, Pa	B. H. Custer	Mar. 9, 1879	....do	38 00	Burglary. Evidence of loss unsatisfactory.
East Jordan, Mich	W. F. Empey	Nov. 18, 1883	....do	22 37	Fire. Claim withdrawn.
Fish Dam, S. C	J. W. Sartor	Aug. 20, 1879	.. do	4 00	Fire. Evidence of loss unsatisfactory.
Fergusonville, N. Y	J. Oliver	Oct. 8, 1877	.. do	10 50	Burglary. Evidence of loss unsatisfactory.
Frio Town, Tex	L. S. White	Apr. 14. 1882	M. O. funds	20 00	Stolen in transit. Money recovered.
Francesville, Ind	William A. Hennegar	Dec. 11, 1883	Stamps	14 00	Burglary. Stamps recovered.
Falkner, Miss	A. J. Rowland	Sept. 15, 1883	do	68 75	Fire. Proper care not exercised.
Great Falls, Va	A. C. Watkins	Mar. 26, 1883	....do	5 25	Fire. Evidence of loss unsatisfactory.
Granville, Ill	L. L. Shepherd	Apr. 18, 1883	....do	21 24	Burglary. Proper care not exercised.
Gothland, Dak.	O. T. Jones	1875			Fire. Evidence of loss unsatisfactory.
Greeenwood, N. Y	George D. Woodward	Mar. 29, 1883	Stamps	5 95	Burglary. Proper care not exercised.
Gray's Mills, Miss	R. G. Owen	June 11, 1879	.. do	37 21	Fire. Claim withdrawn.
Gibson, Mich	H. Doane	Apr. 7, 1884	....do	8 92	Burglary. Evidence of loss unsatisfactory.
Gaines Landing, Ark	John L. Schroeder	Sept. 25, 1884	....do	3 50	Larceny. Not within the provisions of the law.
Golden City, Mo	E. A. Hanna	June 23, 1884	M. O. funds	30 00	Lost in transit. Money recovered.
Guntown, Miss	W. C. Hinds	Nov. 16, 1883	.. do	15 00	Lost in transit. Claim not presented within time prescribed by law.
Hustonville, Ky	F. S. Kauffmann	Jan. 8 and 22, 1876.	Stamps	20 20	Burglary. Proper care not exercised.
Horn Lake, Miss	S. A. Douglass	June 6, 1881	....do	150 00	Fire. Evidence of loss unsatisfactory.
Hughesville, Md	J. W. Chappelear	Sept. —, 1876			Fire. No evidence of loss.
Hamilton, Nev	H. Carpenter		Stamps	70 00	Do.
Hamilton, Ohio	J. McKee	Oct. 1, 1876	....do	57 46	Burglary. No evidence of loss.
Harrison City, Pa	W. J. McQuaid	1874			Do.
Hudson, Ind	F. M. Zimmermann				Burglary. Loss, postal funds. Not within the provisions of the law.
Home Place, La	P. Lyons				Storm. No evidence of loss.
Haverhill, Ohio	J. A. Boyles	Sept. —, 1878			Fire. No evidence of loss.
Hunts Station, Tenn	C. A. Hunt	Nov. 23, 1879			Burglary. No evidence of loss.
Hartville, Mo	E. C. Steel	Oct. 29, 1872			Do.
Henderson Station, Ill	C. E. Henderson	June 9, 1875			Do.
Hopeton, Cal	H. F. Buckley	July 31, 1882			Fire. No evidence of loss.
Hartsville, Tenn	W. J. Neely	Mar. 26, 1874			Do.
Hamlet, N. Y	Isaac Lewarthy	Oct. 23, 1883	Stamps	8 10	Fire. Evidence of loss unsatisfactory.
Howard, Ark	E. E Pierce	Feb. 24, 1882			Burglary. Evidence of loss unsatisfactory.
Hadley Station, Ill	H. F. Jennings	Nov. 28, 1873	Stamps	35 00	Do.
Hearne, Tex	J. A. Roache	Mar. 7, 1882	M. O. funds	3 50	Lost in transit. Money recovered.
Helena Station, Ky	H. C. Hawkins	Dec. 7, 1881	Stamps	58 75	Fire. Proper care not exercised.
Highland, Ohio	J. Cohn	Feb. 15, 1877	....do	70 00	Burglary. Evidence of loss unsatisfactory.
Do	....do	June 5, 1877	.. do	40 00	Do.
Holland, N. Y	C. H. Button	Apr. 27, 1883	....do	30 00	Burglary. Proper care not exercised.
Horr's, Ohio	J. M. Yeazell	May 15, 1883	.. do	12 00	Burglary. Evidence of loss unsatisfactory.
Homewood, Pa	J. H. Witherspoon	Feb. 13. 1884	....do	62 42	Burglary. Stamps recovered.
Houghville, Ind	Thomas E. Shafford	Aug. 17, 1884			Burglary. Loss, $112 in postal funds. Not within the provisions of the law.
Isabella, Ga	Thomas M. Lippett	May 11, 1883	Stamps	21 00	Burglary. Proper care not exercised.
Jerome, Ind	W. F. Templin	Oct. 28, 1880	....do	35 00	Burglary. Stamps recovered.
Jamestown, Ind	William H. Orear	Sept. 11, 1883	....do	36 09	Fire. No actual loss.
Jackson, Miss	George C. McKee	June 4, 1884			Burglary. Loss, $7.50 in postal funds. Not within the provisions of the law
Jasper, N. Y	Andrew Murphy	June 19, 1884	Stamps	40 00	Burglary. Proper care not exercised.
Johnson's Corners, Ohio	A. W. Miller	Aug. 26, 1883	....do	66 00	Do.
Kiskatom, N. Y	D. Bishop	Apr. —, 1877			Fire. No evidence of loss.
Kimmswick, Mo	D. P. Waters	Jan. 19, 1880	Stamps	15 00	Burglary. No evidence of loss.

EXHIBIT B—Continued.

Post-offices.	Postmasters.	Date of loss.	Character of loss.	Amount claimed.	Cause of loss and reasons for disallowance.
Keytesville, Mo	C. Veatch	Apr. 18, 1880			Fire. No evidence of loss.
Kemper, Ill	W. H. H. Kemper				Burglary. No evidence of loss.
Koshkonong, Wis	W. J. Wentworth				Do.
Kingstree, S. C	H. Solomon	Jan. 27, 1883			Fire. Loss, $35 in postal funds. Not within the provisions of the law.
Kempsville, Va	George T. Whitehurst	Feb. 29, 1884	Stamps	$7 00	Fire. Proper care not exercised.
Kirkwood, Mo	Hiram H. Allen	Sept. 14, 1883	....do	49 00	Burglary. Proper care not exercised.
Kensett, Ark	G. W. Daniel	June 26, 1882	.. do	103 52	Do.
King George Court House, Va	W. S. Somers	Sept. 19, 1882	.. do	60 00	Fire. Proper care not exercised.
Key, Ark	C. C. Trumpler	July 25, 1884	Stamps	1 80	Fire. Evidence of loss unsatisfactory.
Kendalia, Tex	James J. Mershon	Sept. 26, 1884			Larceny. Not within the provisions of the law. Loss, $8.20 in. postal funds.
Lutesville, Mo	A. R. Jacques	Mar. 5, 1882	Stamps	9 00	Burglary. Proper care not exercised.
Lincoln Park, N. J	D. Benjamin				Fire. No evidence of loss.
La Grange, Va	C. C. DeLarue	Apr. 17, 1876			Do,
Lebanon, S. C	J. H. Ligan	July 18, 1880			Do.
Lebanon, Conn		May 4, 1882			Burglary. No evidence of loss.
Lamartine, Ark	C. H. Pace				No evidence of loss.
Lebeck, Mo	J. W. Dougherty	Dec. 4, 1883			Fire. Loss, postal funds.
Lorain, Ohio	T. W. Faucher	July 31, 1883	Stamps		Burglary. Proper care not exercised.
Lynchburgh, Ohio	J. W. Henderson	Mar. 22, 1883	....do	30 09	Do.
Lakeland, Minn	L. A. Hunton	Aug. 8, 1882	... do	40 50	Burglary. Claim withdrawn; stamps recovered.
Laramie, Ohio	Michael Moorman	May 7, 1884		68 00	Burglary. Loss postal funds. Not within the provisions of the law.
Lake George, N. Y	E. S. Harris	June 9, 1882	Stamps	160 95	Burglary. Proper care not exercised.
Limestone, N. Y	E. R. Schoonmaker	Apr. 5, 1879	....do	66 63	Do.
Locharbor, La	F. M. Grant	Jan. 27, 1881	....do	20 40	Fire. Evidence of loss unsatisfactory.
Lebanon Junction, Ky	M. J. Cockerell	July 24, 1884	... do	50 87	Burglary. Proper care not exercised.
Liberal, Mo	J. R. Belk	June 23, 1884	M. O. funds	128 00	Lost in transit. Money recovered.
Lockwood, Mo	J. M. Confer	June 23, 1884	....do	50 00	Do.
Lawrence Station, N. Y	Samuel Strickland	July 15, 1884	Stamps	90 60	Burglary. Proper care not exercised.
Merrill's Store, Va	T. B. Seal	Dec. 15, 1874	.. do	7 39	Fire. Proper care not exercised.
Montgomery City, Mo	D. Bruner	May 14, 1879	... do	30 09	Burglary. Proper care not exercised.
Melbourne, Ark	W. R. Sheffield	Oct. 23, 1883	M. O. funds	207 00	Lost in transit. Money recovered.
Mount Mourne, N. C	J. P. Sassaman	Nov. 15, 1876	Stamps	18 23	Fire. Proper care not exercised.
Madison, Ohio	S. A Rand	Apr. 5, 1878	M. O. funds	4 25	Burglary. Proper care not exercised.
Do	....do	Apr. 15, 1878	Stamps	15 00	Do.
Montague, Tex	James M. Grigsley	Oct. 26, 1883	M. O. funds	25 00	Lost in transit. Claim not presented within the time prescribed by law.
Merrill, Ga	Benj. J. Roop	Apr. 23, 1883	Stamps	23 00	Flood. Claim not presented within the time prescribed by law.
Montrose, N. Y	N. F. Chase	July 11, 1874	....do	29 39	Burglary. Claim withdrawn.
Malaby, Ohio	F. B. Rife	July 29, 1882	...do	35 88	Burglary. Proper care not exercised.
Markesan, Wis	Wm. Paddock	Nov. 1, 1883	....do	4 00	Fire. Claim not presented within the time prescribed by law.
Middlefield, N. Y	C. G. Wilson	Aug. 5, 1881	M. O. funds.	10 00	Lost in transit. Proper care not exercised.
Mahomet, Ill	S. C. Abbott	June 18, 1884	....do	120 00	Do.

Morton, Ill	Christian May	July 6, 1883	....do	90 00	Lost in transit. Failure to comply with regulations in remittance.
Middlefield, N. Y	E. C. Briggs	Aug. 14, 1882	Stamps	25 00	Burglary. Proper care not exercised.
Marche, Ark	Chas. Cholnski	Aug. 26, 1884	....do	6 37	Larceny. Not within the provisions of the law.
New Castle, Mo	I. N. Carson, jr	Sept. 9, 1875	.. do	29 00	Fire. Evidence of loss unsatisfactory.
New Hartford, N. Y	Mrs. A. M. Palmer	Nov. 2, 1880	....do	50 00	Burglary. Claim not presented within the time prescribed by law.
New Concord, Ohio	J. McKinney	Feb. 21, 1877	.. do	43 00	Burglary. Proper care not exercised.
Nashua, N. H	H. A. Marsh	Oct. 5, 1883			Burglary. Loss, postal funds, $17.84. Not within the provisions of the law.
Natchitoches, La	Mary A. Burke	Oct. 10, 1883	M. O. funds	152 00	Stolen in transit. Failure to comply with the regulations in remittance
Do	....do	Oct. 21, 1883	....do	120 00	Stolen in transit. Failure to comply with the regulations in remittance.
New Design, Ill	W. D. Druce	Nov. 13, 1878	Stamps	37 10	Burglary. Proper care not exercised.
Osborn, Ohio	S. B. Light	Feb. 27, 1876	....do	216 65	Do.
Owensville, Ind	Ed. G. Wilson	May 18, 1883	....do	6 60	Do.
Opolis, Kans	Theo. L. Holden	Dec. 10, 1883	M. O. funds	48 00	Lost in transit. Money recovered.
Oto, Iowa	D. T. Edmunds	Oct. 15, 1881	Stamps	5 00	Fire. Claim abandoned.
Owen, Ind	William G. Ratts	May 27, 1884	Stamps	17 00	Fire. Proper care not exercised.
Osceola, Ark	Alex. Goodrich	Jan. 22, 1884	M. O. funds	145 00	Lost in transit. Money recovered.
Plainville, Ind	W. Hildreth	Dec. 4, 1882	Stamps	8 00	Burglary. Evidence of loss unsatisfactory.
Prescott, Ind	S. S. Dorsey	Apr. 7, 1867	....do	23 00	Burglary. Proper care not exercised.
Prince Fredericktown, Md	E. V. Dowell	Apr. 3. 1882	....do	8 40	Fire. Claim withdrawn.
Penn Yan, N. Y	Charles C. Miller	Apr. 29, 1873	....do	115 00	Burglary. Evidence of loss unsatisfactory.
Poland, Ohio	George Allen	Mar. 5, 1884			Burglary. Loss, postal funds, $22.50. Not within the provisions of the law.
Philpot, Ky	J. F. Tuttle	Feb. 2, 1884	Stamps	8 00	Burglary. Stamps recovered.
Perkasie, Pa	J. A. Hendricks	July 15, 1882	....do	100 00	Burglary. Proper care not exercised.
Do	....do	Mar. 15, 1883	... do	35 00	Do.
Pittsborough, N. C	Mrs. M. A. Y. Palmer	Aug. 7, 1883	M. O. funds	5 00	Lost in transit. Proper care not exercised.
Pennville, Ind	James A. Russell	Oct. 31, 1882	....do	38 00	Burglary. Claim not presented within time prescribed by law.
Do	....do	Oct. 31, 1882	Stamps	146 17	Do.
Piketon, Mo	D. C. Flynn	June 4, 1883	....do	23 77	Fire. Proper care not exercised.
Peck, Ga	W. A. Davis	Oct. 20, 1880	....do	10 18	Do.
Port Gamble, Wash	D. B. Jackson	Dec. 3, 1880	....do	All on hand.	Fire. Evidence of loss unsatisfactory.
Do	....do	Dec. 3, 1880	M. O. funds	76 00	Do.
Plattsmouth, Nebr	John W. Marshall	Oct. 10, 1884	Stamps	75 00	Larceny. Not within the provisions of the law.
Plumerville, Ark	Daniel Paterson	Oct. 30, 1884			Burglary. Loss, $8 or $10, postal funds. Not within the provisions of the law.
Raymond, Kans	Peter Smith	May 10, 1877	Stamps	15 00	Burglary. Evidence of loss unsatisfactory.
Romeo, Mich	J. Gray	Jan. 19, 1876	...do	12 00	Fire. Evidence of loss unsatisfactory.
Rodamus, W. Va	Thomas W. Nine	Apr. 21, 1883	. do	40 93	Burglary. Proper care not exercised.
Republic, Mich	E. S. Rowland	Sept. 5, 1883	M. O. funds	21 00	Burglary. Claim not presented within the time prescribed by law.
Reno, Nev	E. M. Jameson	Nov. 4, 1880	....do	200 00	Lost in transit. Evidence unsatisfactory.
Roodhouse, Ill	John Roodhouse	July 11, 1884	....do	5 10	Burglary. Proper care not exercised.
Do	....do	July 11, 1884	Stamps	2 40	Do.
Robey, Dak	John Crow	June 18, 1884	....do	31 75	Fire. Evidence of loss unsatisfactory.
Slippery Rock, Pa	Charles Prosser	May 13, 1881	....do	86 00	Burglary. Proper care not exercised.
Snowville, Fla	George E. Wilson	Dec. 18, 1883			Burglary. Loss, postal funds, $6. Not within the provisions of the law.
Sparta, Oreg	W. W. Ross	July 13, 1874	Stamps	10 00	Burglary. Credit previously given.
Sexton, Ark	W. M. Goddard	Jan. 17, 1884			Burglary. Loss, $5, postal funds. Not within the provisions of the law.

EXHIBIT B—Continued.

Post-offices.	Postmasters.	Date of loss.	Character of loss.	Amount claimed.	Cause of loss and reasons for disallowance.
Sharon, Pa	C. W. Ray		Stamps	$48 00	Cause not known. Not within the provisions of the law.
Saugerties N. Y	Thomas Maxwell	Nov. 10, 1880	M. O. funds	5 00	Lost in transit. Failure to comply with regulations in remittance.
Saint Augustine, Fla	W. W. Dewhurst	Apr. 2, 1881	do	4 00	Burglary. Proper care not exercised.
Do	do	Apr. 2, 1881	Stamps	80 00	Do.
Saint Jo, Tex	H. J. T. Moss	Oct. 26, 1883	M. O. funds	482 00	Lost in transit. Claim not presented within the time prescribed by law.
Scales Mount, Ill	H. M. Fowler	Sept. 21, 1874	Stamps	6 00	Burglary. Claim withdrawn.
Swayzee, Ind	L. S. Barrow	Oct. 27, 1883	do	7 50	Fire. Proper care not exercised.
Suffren, N. Y	D. B. Baker	Oct. 7, 1880	do	187 05	Burglary. Evidence unsatisfactory.
Stafford, Ohio	F. Ullmann	Apr. 13, 1883	do	61 74	Burglary. Proper care not exercised.
Shawhan, Ky	A. M. Keller	Sept. 1, 1883			Fire. No claim presented within the time prescribed by law.
Sidney, Dak	R. B. McVay	Sept. 15, 1883	Stamps	13 62	Fire. Proper care not exercised.
Sheldon, Ohio	Henson W. Marlow	June 30, 1884	do	72 74	Burglary. Proper care not exercised.
Syracuse, Mo	W. E. Thomson	Feb. 28, 1879	do	22 63	Fire. Evidence of loss not satisfactory.
Saint James, Mo	William Stimpson	Nov. 26, 1884	do	159 89	Burglary. Claim not presented within the time prescribed by law.
Shawnee, Ohio	L. C. C. Shriver	Apr. 1, 1884	M. O. funds	10 00	Lost in transit. Money recovered.
Sebree, Ky	S. R. Horner	Oct. 12, 1883	Stamps	Not stated.	Fire. Loss insignificant.
Side View, Ky	William P. Staggs	Feb. 26, 1884	Stamps	21 93	Fire. Proper care not exercised.
Do	do	July 1, 1878	do	13 22	Do.
Stonewall, Ky	William N. Penn	Jan. 20, 1884	do	27 10	Do.
Seneca, Mo	Smith Nichols	Apr. 22, 1884	M. O. funds	10 00	Lost in transit. Evidence of loss unsatisfactory.
Snohomish, Wash	W. W. Petit	June 28, 1884			Burglary. Loss, $6, postal funds. Not within the provisions of the law.
Stamford, Conn	Louis S. Begent	Aug. 12, 1884	Stamps	101 00	Larceny. Not within the provisions of the law.
Shiloh, N. C	J. B. Flora	Apr. 16, 1883	do	35 00	Fire. Evidence of loss unsatisfactory.
Sunny Side, Ga	J. T. Gray	May 9, 1884	do	43 44	Fire. Claim not presented within the time prescribed by law.
Sassafras Md	J. E. Hartley	Aug. 11, 1881	do	30 00	Burglary. Evidence of loss unsatisfactory.
Sheldon, Ohio	H. W. Marlow	Feb. 16, 1882	do	19 00	Do.
Somerset, Ky	W. C. Murphy	Nov. 24, 1882	M. O. funds	10 00	Lost in transit. Money recovered.
South Harpswell, Me	William P. Bailey	Jan. 28, 1884	Stamps	15 75	Burglary. Proper care not exercised.
Sheep Ranch, Cal	Joseph Raggio	Apr. 3, 1883	M. O. funds	20 00	Lost in transit. Proper care not exercised.
Tomales, Cal	W. Dutton	Oct. 10, 1875	Stamps	85 00	Burglary. Proper care not exercised.
Transitville, Ind	J. Cornell	Jan. 9, 1872	do	25 62	Do.
Timberville, Ohio	J. P. Logan	Jan. 14, 1882	do	38 00	Fire. Proper care not exercised.
Thibodeaux, La	Gustave Bandreau	Feb. 8, 1884	M. O. funds	20 00	Lost in transit. Claim withdrawn.
Tonawanda, N. Y	Robert L. Koch	June 9 1880	Stamps	29 00	Burglary. Evidence unsatisfactory.
Townsville, Ky	R. G. Brown	Feb. 19, 1884	do	6 00	Storm. Proper care not exercised.
Tyrone, Pa	F. M. Bell	Aug. 30, 1884	do	312 50	Larceny. Not within the provisions of the law.
Tazewell, Tenn	O. H. Ellis	May 5, 8, 1883	M. O. funds	70 00	Lost in transit. Money recovered.
Urbana, Iowa	J. D. Burrell	Aug. 25, 1882	Stamps	20 00	Burglary. Proper care not exercised.
Unionville, Va	E. H. Martin	Apr. 21, 1884	do	5 00	Fire. Claim abandoned.
Vernon, Ind	A. G. Cotton	Dec. 11, 1882	M. O. funds	103 00	Lost in transit. Money recovered.
Vincennes, Ind	W. N. Denny	1874	Stamps	52 00	Burglary. Claim not filed within the time prescribed by law.
Virginia City, Nev	D. O. Adkison	Oct. 26, 1875			Fire. Claim for money-order vouchers destroyed after payment. Not within the provisions of the law.

Vaughn, Tenn	James R. Binkley	Sept. 10, 1884	Stamps	1 59	Destroyed by rats. Not within the provisions of the law.
West Mansfield, Ohio	J. T. Robinson	Jan. 27, 1880	....do	23 37	Burglary. Proper care not exercised.
West Richfield, Ohio*	H. C. Searles	Sept. 4, 1879	M. O. funds	45 16	Do.
Waco, Texas	O. H. Leland	Aug. 13, 1879	do	160 45	Do.
Wrightsville, Ill	Jerry Bethard	Dec. 7, 1883	Stamps	112 00	Burglary. Stamps recovered.
Weaver's Corners, Ohio	Milo McCrillis	Mar. 1, 1883	.. do	75 83	Burglary. Proper care not exercised.
Watertown, Conn*	B. C. Atwood	Nov. 24, 1882	....do	20 00	Do.
Waynesville, Ga	J. W. Hatcher	Aug. 28, 1883	M. O. funds	149 00	Lost in transit. Failure to comply with regulations in remittance.
William Penn, Tex	C A. Walling	July 25, 1883	Stamps	35 00	Fire. Claim not presented within the time prescribed by law.
West Hingham, Mass	Bela F. Lincoln	.....	.....	.....	Larceny. Loss, postal funds. Not within the provisions of the law.
West Chester, Iowa	G. W. James	Apr. 16, 1883	Stamps	33 77	Burglary. Proper care not exercised.
Walnut Ridge, Ark	A. B. Israel	June 8, 1884	....do	2 40	Do.
White Oak, Ga	W. B. Hutchingson	Mar. 20, 1875	....do	9 40	Tornado. Credit previously allowed for entire loss.
Winchester, Ark	B. T. Disbrough	Jan. 25, 1882	.....	.....	Burglary. Loss, $12.33 in postal funds. Not within the provisions of the law.
White Oak, Pa	Peter P. Will	Oct. 22, 1884	.....	.....	Burglary. Loss, $2.50 in postal funds. Not within the provisions of the law.
Yarmouth, Me	Lucy V. Groves	Feb. 8, 1884	.....	.....	Burglary. Loss, $2 in postal funds. Not within the provisions of the law.
Yazoo City, Miss	S. G. Bedevill	July 30, 1879	M. O. funds	200 00	Lost in transit. Money recovered.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 22.

CORRECTING FORMER ESTIMATES.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

A communication from the Comptroller of the Currency, correcting his former estimates for expenses of national currency, and submitting an additional estimate of $110,000 *for expenses of engraving, printing, and finishing national-bank notes for the fiscal year ending June* 30, 1886.

DECEMBER 8, 1884.—Referred to the Committee on Appropriations.
DECEMBER 11, 1884.—Ordered to be printed.

TREASURY DEPARTMENT,
December 6, 1884.

SIR: Referring to the estimate for "expenses of national currency, $50,000, to be found on page 187 of the Book of Estimates for the fiscal year 1886, I have the honor to transmit herewith, for the consideration of Congress, copy of a communication received from the Comptroller of the Currency, in which he states that, through a misunderstanding, his estimate above referred to only covered in amount the estimated cost of "paper, express charges, and other expenses," and did not include "expenses of engraving (except face plates), printing, and finishing circulating notes for national banking associations," estimated at $110,000, for which provision was made in like sum for the fiscal year 1885 in the appropriation for "labor and expenses of engraving and printing" under the Bureau or Engraving and Printing.

Very respectfully,

H. MCCULLOCH,
Secretary.

Hon. JOHN G. CARLISLE,
Speaker, House of Representatives.

TREASURY DEPARTMENT,
OFFICE OF COMPTROLLER OF THE CURRENCY,
Washington, December 4, 1884.

SIR: I would respectfully state that, through a misunderstanding with the Bureau of Engraving and Printing, my estimate of $50,000 for "expenses of national currency for the fiscal year ending June 30,

1886," given in the letter of the 21st ultimo, only covered the estimated cost of "paper, express charges, and other expenses," and did not include an estimate for the "expenses of engraving (except face plates), printing, and finishing circulating notes for national banking associations."

I have, therefore, to submit an additional estimate of $110,000 for "expenses of engraving (except face plates), printing, and finishing circulating notes for national banking associations" for the fiscal year ending June 30, 1886, and respectfully request that it may be transmitted to Congress in connection with the estimate of $50,000, already submitted, making the total estimate for expenses of national currency for fiscal year ending June 30, 1886, $160,000.

Very respectfully,

H. W. CANNON,
Comptroller.

Hon. HUGH MCCULLOCH,
Secretary of the Treasury.

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48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. DOC. No. 23.

REMOVAL AND STORAGE OF MATERIAL FROM GOVERNMENT PRINTING OFFICE.

LETTER

FROM

THE ACTING SECRETARY OF THE TREASURY,

RELATING TO

An immediate appropriation for the removal and storage of material at the Government Printing Office, as provided by joint resolution of February 6, 1883.

DECEMBER 10, 1884.—Referred to the Committee on Appropriations.
DECEMBER 11, 1884.—Ordered to be printed.

TREASURY DEPARTMENT,
December 9, 1884.

SIR: I have the honor to forward herewith, for the consideration of Congress, copy of a communication from the Public Printer of the 6th instant, in relation to the necessity of an immediate appropriation of $5,000 for the removal and storage of certain material from the Government Printing Office, under the provisions of the joint resolution of February 6, 1883 (22 Stat., p. 637).

Very respectfully,

CHAS. E. COON,
Acting Secretary.

Hon. JOHN G. CARLISLE,
Speaker, House of Representatives.

OFFICE OF PUBLIC PRINTER,
Washington, D. C., December 6, 1884.

SIR: I have the honor to call your attention to the necessity of an immediate appropriation of $5,000 for continuing in operation the provisions of the joint resolution approved February 6, 1883 (22 Stat. L., p. 637), directing the Public Printer to remove from the Government Printing Office so much of the public property in the upper stories thereof as shall render the building safe, the sum named in the said resolution having become nearly exhausted.

The reasons for the removal and storage of the property which existed at the time of the passage of the resolution of February 6, 1883, exist to-day, and unless an additional appropriation is made before the former one becomes exhausted, the property must remain in the building, to the great danger of the persons employed therein.

I am, sir, very respectfully,

S. P. ROUNDS,
Public Printer.

Hon. HUGH MCCULLOCH,
Secretary of the Treasury.

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48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 24.

SCHOONER DRUID DAMAGES.

LETTER

FROM

THE ACTING SECRETARY OF THE TREASURY,

TRANSMITTING

An estimate from the Secretary of the Navy of the appropriation required to pay owners of the schooner Druid damages sustained by collision with United States steamer Powhatan.

DECEMBER 10, 1884.—Referred to the Committee on Appropriations.
DECEMER 11, 1884.—Ordered to be printed.

TREASURY DEPARTMENT,
December 9, 1884.

SIR: I have the honor to forward herewith, for the consideration of Congress, an estimate of appropriation received from the Secretary of the Navy to pay the claim of the owners of the schooner Druid for damages occasioned by the collision of that vessel with the United States steamer Powhatan, in October, 1883, amounting to $11,519.88, as fully set forth in the accompanying papers.

Very respectfully,

CHAS. E. COON,
Acting Secretary.

Hon. JOHN G. CARLISLE,
Speaker, House Representatives.

NAVY DEPARTMENT,
Washington, December 6, 1884.

SIR: Referring to the provision in section 2 of the deficiency appropriation act of July 7, 1884, relating to estimates of appropriations upon which legislative action is necessary, I inclose herewith, in printed form, the claim of the owners of the schooner Druid for damages occasioned by the collision of that vessel with the United States steamer Powhatan, in October, 1883, amounting to $11,519.88, which claim was presented by this Department for the consideration of the Committee on Appropriations of the last session of Congress with a letter dated March 31, 1884, copy of which is also inclosed herewith, in which the

previous action of the Department in connection with the case is fully set forth, and I have to request that, in accordance with the provision above referred to, an estimate of the necessary appropriation for said claim be duly transmitted to Congress.

Very respectfully,

WM. E. CHANDLER,
Secretary of the Navy.

HON. HUGH MCCULLOCH,
Secretary of the Treasury.

NAVY DEPARTMENT,
Washington, December 28, 1883.

GENERAL COURT-MARTIAL ORDERS NO. 44.

I. Before a general court-martial, which convened at the navy-yard, Boston, Mass., December 3, 1883, and of which Commodore William G. Temple, U. S. N., is president, were arraigned and tried Capt. Andrew W. Johnson and Lieut. Charles A. Stone, U. S. N.

CHARGE.—"Culpable negligence and inefficiency in the performance of duty."

Specification.—"In this, that the said Andrew W. Johnson, a captain in the United States Navy, being in command of the United States steamer Powhatan, and the said Charles A. Stone, a lieutenant in the United States Navy, being on duty as officer of the deck of said steamer, on the 15th day of October, 1883, between the hours of 4 and 6 o'clock post meridian, the said steamer being then at sea, in or about latitude 43 degrees 53 minutes north, longitude 64 degrees 13 minutes west, proceeding on a westerly course under steam and sail, and a certain sail vessel, namely, the schooner Druid, of Lunenburg, Nova Scotia, being also then at sea, in or about the latitude and longitude aforesaid, proceeding on a southerly course under sail, which respective courses of the said vessels, if continued without deviation, involved risk of collision, did severally neglect and fail to cause the course of the said steamer to be changed, or her rate of speed diminished, so as to keep out of the way of the said schooner, and did also then and there severally neglect and fail to take such other timely precautions, and to issue such timely orders, respecting the movements of said steamer, as were proper and necessary to avoid a collision with said schooner, and were therein and thereby severally culpably negligent and inefficient in the performance of their duty, by reason of which culpable negligence and inefficiency on the part of the said Captain Johnson, as commanding officer, and of the said Lieutenant Stone, as officer of the deck, of said steamer, a collision did then and there occur between the said steamer Powhatan and the said schooner Druid, whereby both of said vessels were damaged, and whereby the said schooner was so greatly damaged that it became necessary to immediately transfer her officers and crew to the said steamer for safety, and to tow the wreck of said schooner into port."

To which charge and specification the accused, Capt. Andrew W. Johnson and Lieut. Charles A. Stone, U. S. Navy, pleaded "not guilty."

In accordance with the request of Captain Johnson the court decided to grant him a separate trial, and thereupon proceeded with the trial of Lieutenant Stone.

FINDING.

The court found, as to Lieut. Charles A. Stone:

The *specification* of the charge, "Proved in part, proved except the words 'whereby the said schooner was so greatly damaged that it became necessary to immediately transfer her officers and crew to the said steamer for safety,' and the excepted words not proved." And the court found the accused, Lieutenant Stone, of the charge, "Guilty."

SENTENCE.

The court thereupon sentenced the said, Lieut. Charles A. Stone, U. S. Navy, "to be suspended from rank and duty for two years, on waiting orders pay, during which time he shall retain his present number on the list of lieutenants, and that he be reprimanded in general orders by the honorable Secretary of the Navy."

II. The court having concluded the trial of Lieutenant Stone, proceeded with that of Capt. Andrew W. Johnson, U. S. Navy, upon the foregoing charge and specification.

FINDING.

The court found, as to Capt. Andrew W. Johnson:

The *specification* of the charge, "Proved in part, proved except the words, 'did neglect and fail to cause the course of the said steamer to be changed, or her rate of speed to be diminished, so as to keep out of the way of the said schooner, and did also, then and there, neglect and fail to take such other timely precautions, and to issue such timely orders, respecting the movements of said steamer, as were proper and necessary to avoid a collision with said schooner, and was therein and thereby culpably negligent and inefficient in the performance of his duty;' also the words 'and whereby the said schooner was so greatly damaged that it became necessary to immediately transfer her officers and crew to the said steamer for safety,' and the excepted words not proved."

And the court found the accused, Captain Johnson, of the charge "Not guilty."

And the court thereupon fully acquitted the accused, Capt. Andrew W. Johnson, U. S. Navy, of the charge and specification.

III. The proceedings, finding, and sentence of the general court-martial in the foregoing case of Lieut. Charles A. Stone, U. S. Navy, are approved.

In administering the reprimand required by the sentence in the case of Lieutenant Stone, it is to be remarked that the officer of the deck, for the time being, is vested, in case of emergency, with the entire control of the vessel's movements. While under ordinary circumstances he should not change her course without orders from the commanding officer, yet, if there is danger of collision, he should promptly so change it according to his judgment as to avoid the danger. The authority thus vested in him is absolute; the only limitation being that he shall report his action to the commanding officer without delay. The power conferred carries with it a corresponding degree of responsibility, and the officer who, while intrusted with it, fails in its proper exercise, either in giving the necessary order or in seeing it obeyed, must be held responsible for the consequence of his neglect.

The offense set forth in the specification, and of which Lieutenant Stone was found guilty, is one deserving severe punishment. It is aggravated by the fact that he had ample time in which to exercise his discretion or to seek the direction of his commanding officer. For more than an hour, in broad daylight, and in plain sight, the Druid had been nearing the Powhatan. It is no excuse to say that he acted under a wrong impression concerning the intentions of the approaching vessel. The fact that she was a sail vessel threw upon him the duty of so controlling the movements of the Powhatan as to give the Druid a free exercise of her right of way. This might have been readily done, either by checking the speed of the Powhatan or slightly changing her course. His duty, as officer of the deck, was plain and imperative; instead of promptly performing it he trusted to an impression which proved to be erroneous, and which, whether true or false, he had no right to entertain as a reason for delaying the performance of his duty. The result was that an inexcusable collision occurred, for which, and its disastrous consequences, he was primarily responsible, and is punished only too leniently.

IV. In the case of Captain Johnson a concurrence in the finding of the court would be equivalent to the expression of an opinion that this officer has not been negligent or inefficient, but, on the contrary, has been reasonably diligent in the performance of his duty. The Department is not willing to place itself upon record as so believing.

According to Captain Johnson's statement, he was first informed of the approach of the schooner Druid at about 3.30, and of her close proximity at about 5.15 p. m., the collision occurring within five minutes thereafter. In the interval succeeding the first report he says he observed the schooner, from the starboard cabin port, standing on a course apparently parallel to that of the Powhatan and at a perfectly safe working distance. This, it seems, was all the knowledge he had of her movements, although, from 4 to 5.15 p. m. she was, in fact, standing on a course which, without change in that of either vessel, would necessarily bring, and did bring, the two into collision. Relying, nevertheless, on the judgment of the officer of the deck, and because he says he made no urgent report, Captain Johnson, when informed that the schooner was approaching closely with the purpose, apparently, of speaking the Powhatan, deemed it unnecessary either to go on deck or to send any orders to the officer of the deck; and his defense is that he was not called upon to take such action, or any action whatever.

This is not the opinion of the Department. There was ample time between Lieutenant Stone's report and the collision for Captain Johnson to have sent instructions to the officer of the deck to change the course of the Powhatan, or to have ordered his executive officer, then in conversation with him in the cabin, to go on deck, or to have gone there himself; in either of which events the disaster would have been averted. The neglect to do anything whatever cannot, under the circumstances, be regarded as an exercise of due diligence, but, on the contrary, in the opinion of the Department, required a finding that Captain Johnson was guilty of inexcusable negligence.

Notwithstanding the number, rank, and experience of the officers comprising the court, the Department does not accept their lenient judgment as the correct measure of the duty of a commanding officer. Greater diligence to avoid impending collisions, under circumstances no more difficult than those which appear in this case, must hereafter be exercised; and commanding officers will be held to the strictest responsibility in every case which may unfortunately occur.

The finding of the general court-martial in the case of Capt. Andrew W. Johnson, U. S. Navy, is hereby disapproved, and he is released from arrest and restored to duty.

V. The sentence in the case of Lieut. Charles A. Stone, U. S. Navy, will take effect from this date.

WILLIAM E. CHANDLER,
Secretary of the Navy.

NAVY DEPARTMENT,
Washington, March 31, 1884.

SIR: I have the honor to present for the consideration of the Committee on Appropriations the following facts:

On the 15th of October, 1883, a collision occurred at sea, off the coast of Halifax, between the schooner Druid, of and from Lunenburg, N. S., bound for a port in the West Indies, and the U. S. S. Powhatan, bound for the port of Boston, Mass.

On the 23d of October a court of inquiry was ordered to investigate and report the circumstances attending the collision and where the blame, if any, should rest. On the 30th of November the court reported that the officer of the deck of the Powhatan, Lieut. Charles A. Stone, U. S. N., was responsible for the collision. On the 23d of November a general court-martial was ordered for the trial of Lieutenant Stone, and also of Capt. A. W. Johnson, the commanding officer of the Powhatan, upon a charge of culpable negligence and inefficiency in the performance of duty while navigating the Powhatan at the time of the collision.

Lieutenant Stone was tried first, found guilty of the charge, and sentenced to suspension from rank and duty for two years, on waiting orders pay, and to be reprimanded in general orders by the Secretary of the Navy. Captain Johnson was next tried and acquitted, but the finding of "not guilty" in his case was disapproved. A copy of General Court-Martial Orders No. 44, showing the action of the revising authority upon the respective cases, is herewith inclosed for the further information of the committee.

On the 19th of December the owners of the Druid filed their claim for $11,519.88 as the aggregate amount of loss and damage to vessel and cargo resulting from the collision.

On the 11th of January, 1884, a Board of officers was duly appointed to examine the claim in detail, together with the proofs and vouchers connected therewith, which Board, after such examination, reported a total allowance of $11,201.43 in favor of the claimants. Being satisfied that such allowance is just and proper, I respectfully suggest that suitable provision for the payment thereof be made in the sundry civil bill.

I transmit herewith, for the further information of the committee, a copy of the claim as originally submitted to the Department, together with a copy of the order appointing a Board of officers to examine the same, and a tabular statement of the items thereof as passed upon and either allowed, disallowed, or reduced by the Board.

Very respectfully,

WM. E. CHANDLER,
Secretary of the Navy.

Hon. SAMUEL J. RANDALL,
Chairman Committee on Appropriations, House of Representatives.

NAVY DEPARTMENT,
Washington, January 11, 1884.

SIR: A Board, consisting of yourself as president, and Naval Constructor Thomas E. Webb and Lieut. Commander Oscar W. Farenholt, U. S. N., as members, and Capt. Robert L. Meade, U. S. M. C., as recorder, is hereby ordered to convene at the navy-yard, Boston, Mass., on Tuesday, the 15th instant, or as soon thereafter as practicable, for the purpose of examining and reporting upon the claim of the owners of the schooner Druid, of Lunenburg, Nova Scotia, and her cargo, against the United States, for losses and damages resulting from the collision between the United States steamship Powhatan and that vessel on the 15th day of October, 1883.

A statement of said claim in detail, accompanied by sundry exhibits, marked A to I, inclusive, and which has been filed in the Department, is transmitted with this precept.

The Board will carefully examine the items of said claim and the documentary evidence appended to the statement thereof, and will, in its discretion, require the production, on the part of the claimants, of such further proof as may be necessary, with reference to the following points, viz:

First. As to the standing or rating of the vessel upon the books of the underwriters at the date of her departure upon the voyage referred to.

Second. Whether the vessel was insured, and if so, for how much, in what company or companies, and for whose benefit; also whether any and, if so, how much of such insurance has been or will be paid, and to whom.

Third. As to the kind, quantity, and value of the cargo.

Fourth. As to insurance upon the cargo, or parts thereof, with particulars as above required concerning insurance on the vessel.

Fifth. As to the probable earnings of the vessel, under the charter party, had the voyage been accomplished.

Sixth. As to the condition and value of the vessel immediately after the collision or upon her arrival at Boston.

Seventh. As to the condition and value of the cargo when discharged.

Eighth. As to the proceedings had before and at the sale of the vessel, with reference to the expediency of selling instead of repairing the same, and as to the regularity of such sale, including the advertisement thereof, and the publicity given thereto.

Ninth. As to the regularity of the proceedings with reference to the sale of the cargo, including the advertisement thereof and the publicity given thereto.

Tenth. As to incidental expenditures incurred in connection with the survey, advertisement, and sale of the vessel and cargo, the amount of such expenditures, and the allowance which should be made on account thereof.

Eleventh. As to incidental expenditures connected with the investigation before the court of inquiry, their amount, and what allowance, if any, should be made on account thereof.

Twelfth. As to the proceeds of the vessel and cargo; whether a fair merchantable value was realized upon the sale thereof, respectively, and, if not, the difference between such value and the amount actually realized.

The object of the examination being to enable the Department to determine, if practicable, what amount of damage has been sustained by the claimants, for which the Government should compensate them, the Board will, in making its report, designate the several items of the claim which, in its judgment, should be disallowed, in whole or in part, and, if in part, to what extent a reduction should be made.

I transmit, also, letters from Whitney, Pousland & Co., agents, dated 13th and 19th ultimo, with inclosures, relating to claims for services rendered by Arthur H. Zwicker, managing owner, Capt. Charles Smeltzer, master, and Zacharius Crawford, mate, of the Druid, such services being alleged to have become necessary and to have been rendered in consequence of the collision above referred to.

Mr. Zwicker claims $140.

Captain Smeltzer and Mate Crawford acknowledge that they have already received, the former $78, and the latter $48, from the Government, and ask for additional compensation.

The Board will include these claims in its examination, requiring such proof respecting the necessity and value of the alleged service as it may deem proper, and will state in its report whether the Government should make compensation for the same, and, if so, to what extent in each case.

All the papers transmitted herewith will be returned with the report of the Board. This employment on shore duty is required by the public interests, and such service will continue until February 15, 1884, unless it is otherwise ordered.

Very respectfully,

WM. E. CHANDLER,
Secretary of the Navy.

Capt. FRANCIS M. BUNCE, U. S. N.,
Commanding U. S. R. S. Wabash, Navy-Yard, Boston, Mass.

[Whitney, Pousland & Co.; cable address, "Pousland."]

BOSTON, *December* 19, 1883.

DEAR SIR: We had the honor of addressing you, on the 13th instant, regarding additional compensation to the captain and mate of the schooner Druid, and remain as yet without reply, which will doubtless come to hand in due course.

Herewith we beg to hand you claim for loss and damage attending the Druid and Powhatan collision, which claim has been made up by Messrs. Winship Brothers & Gore, of our city, experts in marine adjustments, who we trust have made it up in proper and acceptable form. They assure us that it is made up in accordance with what is considered law and custom in such matters by our underwriters.

Regarding valuations, we have to respectfully submit that it is our opinion that they are very fair, else we should not be a party to their presentation.

We shall be glad to furnish any other evidence or explanation which may be desired, and if we can be of any service in the matter to the Department, as well as to our principals, beg you to command us.

In addition to the formal claim, we beg further to present, in what seems to be equity, the claim of Mr. Arthur Zwicker, an owner in both vessel and cargo, for compensation for his time during absence from home.

Submitting all to your kind consideration, we remain,

Very respectfully,

WHITNEY, POUSLAND & CO.,
Agents for Owners of British Schooner Druid and Owners of Cargo.

Hon. WM. E. CHANDLER,
Secretary of the Navy.

Statement of claim for damage done by United States steam frigate Powhatan to schooner Druid, of Lunenburg, Nova Scotia, and her cargo, on the 15th day of October, 1883.

Schooner Druid, with all her tackle and appurtenances, valued per certificate hereto annexed and marked A, of David Smith, shipwright, Peter Young, shipwright, James R. Rudolph, merchant, and Edward Gerhardt, master mariner, dated at Lunenburg, Nova Scotia, November 26, 1883			$6,700 00
Deduct proceeds of vessel at auction, per account of H. Harris & Co., hereto annexed and marked B		$1,775 00	
Less—			
Auction charges, advertising	$15 00		
Whitney, Pousland & Co., charges for superintending and arranging for sale at auction, 2½ per cent	44 38		
Auctioneer's commission, 2½ per cent	44 38		
		103 76	
			1,671 24
Sundry expenses necessarily incurred in consequence of the vessel bearing away for the port of Boston in a disabled condition, and paid by Whitney, Pousland & Co., per account annexed and marked C:			
Telegram to Lunenburg	$0 65		
Do	1 49		
Do	68		
Do	1 76		
Do	65		
Do	1 04		
		6 27	
Noting protest, $1; extending protest, $10		11 00	
Custom-house entry, $3.20; tonnage dues, $28.80		32 00	
Stevedore's bill for discharging cargo		33 95	
Carriage hire to vessel		1 50	
Towage to Fort Hill dock to discharge		4 00	
Towage to Lewis's wharf to discharge, not being able to get into dock		4 00	
H. B. M. consul's fee for entry		1 25	
James Munroe, rating chronometer		2 50	
H. B. M. consul's fee for certifying protest		3 75	
Telegram to Hon. W. E. Chandler, Secretary, at Washington		31	
R. G. F. Candage, survey on vessel		20 00	
Asa Story, survey on vessel		20 00	
		140 53	
J. C. Dodge & Sons, services and expenses attending the sessions of the board of inquiry at Charlestown, 6 days, marked C		301 57	
Winship Bros. & Gore, bill for services and advice as adjusters relating to the surveys and sale of vessel and cargo, marked D		200 00	

Arthur H. Zwicker, owner:				
Account for cash paid, marked E—				
Passage to Halifax from Lunenburg		$2 00		
Meals		1 00		
Board at Halifax		2 00		
Railroad fare to Boston via St. John		14 50		
Cab hire		50		
Meals		3 00		
Board at Boston, 22 days, at $3.25		71 50		
Cab hire		3 50		
Railroad fare to Halifax		14 50		
Meals		3 00		
Cab hire		50		
Board at Halifax		3 00		
Passage and meals to Lunenburg		3 00		
Telegrams		4 00		
			$126 00	
				$768 10
				$903 14
Net loss on vessel				5,796 86
Cargo of schooner Druid, per declaration of William N. Zwicker, of the firm of Zwicker & Co., of Lunenburg, Nova Scotia, the 26th day of November, 1883, per certificate herewith, marked F				7,462 88
Deduct—				
Proceeds of cargo at auction, per account sales herewith, marked G.			$2,690 03	
Less auction charges, as follows:				
Advertising and posters		$17 50		
Auctioneer's commission, 2½ per cent		67 25		
Whitney, Pousland & Co., charges for superintending and arranging sale of cargo, 2½ per cent		67 25		
			152 00	
Sale of 360 cabbages by Whitney, Pousland & Co., at 5 cents			18 00	
				2,556 03
				4,906 85
Add amount paid by Whitney, Pousland & Co., per account herewith, marked H:				
Custom-house duty on cabbages			1 80	
Custom-house duty on lumber			10 00	
Lewis's wharf, wharfage and storage, per bill			69 01	
Custom-house entry			1 00	
Surveying lumber			67	
Cooperage			11 85	
Telegrams			1 04	
Candage *et al.*, survey on cargo			30 00	
Fire insurance			2 00	
Short delivery of 1 box fish			1 30	
				128 67
Net loss on cargo				5,035 52
Loss of charter by breaking up of the voyage:				
Amount of freight per charter party, herewith, marked I, dated at Lunenburg, Nova Scotia, October 12, 1882				975 00
Deduct sundry charges for which the owners of the vessel would have been subjected after the date of the collision to enable them to earn the charter, assuming the voyage out and home (or to Boston, for which a cargo was ordered) to be seven weeks:				
Wages of crew for three weeks, one month's wages having been advanced:				
Master, per month			$50 00	
Mate, per month			30 00	
Cook, per month			28 00	
Three A. B. seamen, at $18 per month			54 00	
			162 00	
Three weeks is			121 50	
Provisions for two months, based upon the rule for general average in Atlantic ports:				
Master	per day..	$1 00		
Mate	do....	50		
4 men, at 25 cents	do....	1 00		
		2 50		
50 days		125 00		
Cost of loading cargo at West Indies, the discharging of outward cargo being done by the crew		15 00		
Cost of discharging home cargo at Boston		20 00		
Towage (say)		6 00		
			287 50	
Net loss of charter			687 50	687 50
Total claim				11,519 88

Statement of claim for damage done by United States steam frigate Powhatan to schooner Druid, of Lunenburg, Nova Scotia, and her cargo, on the 15th day of October, 1883.

				Remarks by Board.	
				Allowed as fair by Board.	Disallowed for reasons given in body of report.
Schooner Druid, with all her tackle and appurtenances, valued as per certificate annexed to claim.	.....	.....	$6,700 00	Fair	
Deduct proceeds of vessel at auction per account of H. Harris & Co., annexed to claim.	.....	$1,775 00	.....	Fair	
Less:					
Auction charges, advertising	$15 00	.....	.....	Fair	
Superintending and arranging for sale at auction, 2½ per cent.	44 38	.....	.....	Fair	
Auctioneer's commission, 2½ per cent ...	44 38	103 76	.....	Fair	
		1,671 24	.....	Fair	
Sundry expenses necessarily incurred in consequence of the vessel bearing away for the port of Boston in a disabled condition, and paid by Whitney, Pousland & Co., per account annexed to statement of claim:					
Telegram to Lunenburg..... $0 65					
Do 1 49					
Do 68					
Do 1 76					
Do 65					
Do 1 04					
	6 27	.....	.....	Fair	
Noting protest, $1; extending protest, $10.	11 00	.....	.....	Fair	
Custom-house entry, $3.20; tonnage dues, $28.80.	32 00	.....	.....	Fair	
Stevedore's bill for discharging cargo...	33 95	.....	.....	Fair	
Carriage hire to vessel, $1.50	.....	.....	.....	.....	Disallowed.
Towage to Fort Hill Dock to discharge..	4 00	.....	.....	Fair	
Towage to Lewis's Wharf to discharge, not being able to get into dock.	4 00	.....	.....	Fair	
Her Britannic Majesty's consul's fee for entry.	1 25	.....	.....	Fair	
James Munroe, rating chronometer	2 50	.....	.....	Fair	
Her Britannic Majesty's consul's fee, certifying protest.	3 75	.....	.....	Fair	
Telegram to Hon. W. E. Chandler, Secretary, at Washington.	31	.....	.....	Fair	
R. G. F. Candage, survey on vessel	20 00	.....	.....	Fair	
Asa Story, survey on vessel	20 00	.....	.....	Fair	
	139 03	.....	.....		
J. C. Dodge & Sons, services and expenses attending sessions of the Board of Inquiry at Charlestown, 6 days.	301 57	.....	.....	Fair	
Winship Bros. & Gore, bill for services and advice as adjusters, relating to the survey and sale of vessel and cargo, $200. Disallowed; $100 allowed.	100 00	.....	.....	.....	Disallowed; $100 allowed.
Arthur H. Zwicker, owner. Account for cash paid, as follows:					
Passage to Halifax from Lunenburg. $2 00	.....	.....	.....	.....	Disallowed.
Meals 1 00	.....	.....	.....	.....	Do.
Board at Halifax..... 2 00	.....	.....	.....	.....	Do.
Railroad fare to Boston, via St John. 14 50	.....	.....	.....	.....	Do.
Cab hire..... 50	.....	.....	.....	.....	Do.
Meals 3 00	.....	.....	.....	.....	Do.
Board at Boston, 22 days, at $3.25. 71 50	.....	.....	.....	.....	Do.
Cab hire 3 50	.....	.....	.....	.....	Do.
Railroad fare to Halifax..... 14 50	.....	.....	.....	.....	Do.
Meals 3 00	.....	.....	.....	.....	Do.
Cab hire 50	.....	.....	.....	.....	Do.
Board at Halifax..... 3 00	.....	.....	.....	.....	Do.
Passage and meals at Lunenburg. 3 00	.....	.....	.....	.....	Do.
Telegrams 4 00	4 00	.....	.....	Fair	
	.....	545 60	1,125 64	.....	

Claim for damage done by United States steam frigate Powhatan, &c.—Continued.

				Remarks by Board.	
				Allowed as fair by Board.	Disallowed for reasons given in body of report.
Net loss on vessel allowed by Board as fair.	.....	.....	$5,574 36	Fair	
Cargo of schooner Druid, per declaration and certificate attached to claim.	.....	$7,462 88	.....	Fair	
Deduct proceeds of cargo at auction, per account sales attached to claim.	$2,690 03	.....	.....	Fair	
Less auction charges, as follows:					
Advertising and posters .. $17 50					
Auctioneer's commission, 2½ per cent 67 25					
Whitney, Pousland & Co., charges for superintending and arranging sale of cargo, 2½ per cent 67 25					
	152 00	.....	.....	Fair	
Sale of 360 cabbages by Whitney, Pousland & Co., at 5 cents.	18 00	.....	.....	Fair	
		2,556 03			
Add amount paid by Whitney, Pousland & Co., per account attached to claim:		4,906 85			
Custom-house duty on cabbages	1 80	.....	.....	Fair	
Custom-house duty on lumber	10 00	.....	.....	Fair	
Lewis Wharf, wharfage and storage per bill.	69 01	.....	.....	Fair	
Custom-house entry	1 00	.....	.....	Fair	
Surveying lumber	67	.....	.....	Fair	
Cooperage	11 85	.....	.....	Fair	
Telegrams	1 04	.....	.....	Fair	
Candage *et al.*, survey on cargo	30 00	.....	.....	Fair	
Fire insurance	2 00	.....	.....	Fair	
Short delivery of 1 box fish	1 30	.....	.....	Fair	
		128 67			
Net loss on cargo allowed by Board as fair.	.....	.....	5,035 52	Fair	
Loss of charter by breaking up the voyage; amount of freight per charter party attached to statement of claim.	.....	975 00	.....	Fair	
Deduct sundry charges for which the owners of the vessel would have been subjected after the date of the collision to enable them to earn the charter, assuming the voyage out and home (or to Boston, for which a cargo was ordered) to be seven weeks. Wages of crew for three weeks, one month's wages having been advanced:					
Master, per month $50 00					
Mate, per month 30 00					
Cook, per month 28 00					
Three able-bodied seamen, at $18 per month 54 00					
Total per month 162 00					
Three weeks = $121.50 is allowed as error; seven weeks is	283 50	.....	.....	.....	Three weeks' allowance disallowed. See body of report.
Provisions, for two months, based upon the rule for general average in Atlantic ports:					
Master $1 00					
Mate 50					
Four men, at 25 cents 1 00					
2 50					
Fifty days	125 00	.....	.....	Fair	
Cost of loading cargo at West Indies, the discharging of outward cargoes being done by the crew.	15 00	.....	.....	Fair	
Cost of discharging home cargo at Boston, $20. Disallowed.	33 95	.....	.....	.....	$20 disallowed stevedore's bill; $33.95 being substituted therefor by Board.
Towage	6 00	463 45	.....	.....	
Net loss on charter	.....	511 55	511 55		
Total claim allowed as fair	.....	.....	11,121 43		

Claim for damage done by United States steam frigate Powhatan, &c.—Continued.

				Remarks by Board.	
				Allowed as fair by Board.	Disallowed for reasons given in body of report.
RECAPITULATION.					
Net loss on vessel			$5,574 36		
Net loss on cargo			5,035 52		
Net loss on charter			511 55		
			11,121 43		
Allowance to captain			50 00		
Allowance to mate			30 00		
Total			11,201 43		

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 25.

PRINTING REVISED LAWS OF WYOMING TERRITORY.

LETTER

FROM THE

ACTING SECRETARY OF THE TREASURY,

TRANSMITTING

Letter from the First Comptroller of the Treasury, with inclosures, relating to estimate of appropriation for printing revised laws of Wyoming Territory.

DECEMBER 10, 1884.—Referred to the Committee on Appropriations.
DECEMBER 11, 1884.—Ordered to be printed.

TREASURY DEPARTMENT,
December 9, 1884.

SIR: I have the honor to transmit herewith, for the consideration of Congress, copy of a communication from the First Comptroller of the Treasury, and inclosures, relating to an estimate of appropriation for $3,000 to print the revised laws of the Territory of Wyoming, revised and compiled under an act of the legislature of Wyoming approved February 29, 1884.

Very respectfully,

CHAS. E. COON,
Acting Secretary.

Hon. JOHN G. CARLISLE,
Speaker, House of Representatives.

TREASURY DEPARTMENT,
OFFICE OF THE FIRST COMPTROLLER,
Washington, D. C., December 3, 1884.

SIR: Herewith is transmitted, for your action thereon, a communication with one inclosure from E. S. N. Morgan, secretary of the Territory of Wyoming, asking that an appropriation be requested for printing the code of that Territory, which is by me approved for a sum not to exceed $3,000.

Respectfully,

WILLIAM LAWRENCE,
Comptroller,
By J. TARBELL,
Deputy Comptroller.

Hon. HUGH MCCULLOCH,
Secretary of the Treasury.

TERRITORY OF WYOMING,
EXECUTIVE DEPARTMENT, SECRETARY'S OFFICE,
Cheyenne, Wyo., November 22, 1884.

SIR: The eighth (1884) legislative assembly of Wyoming Territory provided for a compilation of the laws; a copy of the act inclosed.

A commission, consisting of Hons. W. W. Corlett, Isaac P. Caldwell, and Clarence D. Clark, was duly appointed by the governor and confirmed by the council. The commissioners have labored diligently, and the compilation will be completed in time for the action of the ninth (1886) legislature.

It is designed to publish the compilation, under a contract to be made by the commission, in the best possible style, and the work will differ considerably from the usual session laws published and paid for by the United States, under direction from your office.

It is most desirable that the session laws of the ninth legislative assembly be included in, and be made a uniform part of, the work; and I respectfully recommend that "the secretary of Wyoming Territory be authorized to pay to the order of the chairman of the commission, for the use of Wyoming Territory in the publication of the compilation, any balance of the amount appropriated by Congress for public printing for Wyoming Territory for the fiscal year ending June 30, 1886."

This communication will be handed to you by Hon. M. E. Post, our Delegate to Congress, who will confer with you in regard to it. Hon. W. W. Corlett, the chairman of the compilation commission, a gentleman of the very highest character, standing, and ability, will visit Washington during the coming session of Congress, and will furnish you any additional information on this subject you may desire. I am uncertain if a ruling of your Department will govern this case, or if action by Congress will be necessary; should Congressional action be necessary, I trust you will aid us by your recommendation.

Very respectfully,

E. S. N. MORGAN,
Secretary Wyoming Territory.

Hon. WILLIAM LAWRENCE,
First Comptroller Treasury, Washington, D. C.

LAWS OF WYOMING.

CHAPTER 86—STATUTE LAWS—REVISION AND COMPILATION.

AN ACT to provide for the revision and compilation of the Statute Laws of Wyoming Territory, and for other purposes.

Be it enacted by the Council and House of Representatives of the Territory of Wyoming,

1. That the governor of the Territory of Wyoming be, and is hereby, authorized, by and with the advice and consent of the council, to appoint three persons, learned in the law, as commissioners, to revise, simplify, arrange, and consolidate all statutes of the Territory which shall be in force at the time such commissioners shall make their final report of their doings: *Provided*, That no attorney shall be appointed as one of the above-named commissioners who has not been a practicing attorney in the Territory of Wyoming for a period of more than two years.

SEC. 2. That in performing this duty the commissioners shall bring together all statutes and parts of statutes which, from similarity of subjects, ought to be brought together, omitting all redundant, repealed, and obsolete enactments, and making such alterations as may be necessary to reconcile the contradictions, supply the omissions, and amend the imperfections of the original text; and they shall arrange the same under chapters and sections or other suitable divisions and subdivisions, with head notes briefly expressed, of the matter contained in such divisions; also with side notes so drawn as to point to the contents of the text, and with references to the original text from which each section is compiled; and they shall provide by a temporary index, or other expedient, means for an easy reference to every portion of their report, and the compilation and revision herein provided for shall be so prepared as to show in some suitable manner all changes in and additions proposed to be made to the existing law of the Territory.

SEC. 3. That when the commissioners have completed the revision, compilation, and consolidation of the statutes as aforesaid, they shall cause a copy of the same to be filed in the office of the secretary of the Territory, to be submitted to the ninth legislative assembly of the Territory upon its convening, that the statutes so revised, amended, added to, and consolidated, may be re-enacted if the legislative assembly

of the Territory shall so determine, and at the same time they shall designate such statutes or parts of statutes as in their judgment ought to be repealed, together with any provisions which in their judgment ought to be enacted in lieu thereof or in addition thereto.

SEC. 4. That the commissioners shall each receive a compensation for his services of $1,200; and said commissioners shall also be authorized to employ one clerk, who shall receive for his services the sum of $800, and to expend a sum not exceeding $100 for stationery.

SEC. 5. Upon the completion of the work of said commissioners, and the filing of the same in the office of the secretary as aforesaid, it shall be the duty of the governor and secretary of the Territory to examine the same, and, as soon as practicable, determine whether the same has been done, and a report made, in conformity to this act; and if they shall so determine, they shall file their decision with the auditor of the Territory, upon which it shall be lawful for the auditor to draw warrants for the payment of any expenses incurred under this act, upon any appropriation made for the payment of such expenses.

SEC. 6. This act shall take effect and be in force from and after its passage and approval.

Approved February 29, 1884.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 26.

APPROPRIATION FOR INDIAN SERVICE.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

Supplemental estimates from the Interior Department of appropriations for the Indian service for the fiscal year ending June 30, 1886.

DECEMBER 8, 1884.—Referred to the Committee on Appropriations.
DECEMBER 11, 1884.—Ordered to be printed.

TREASURY DEPARTMENT,
December 4, 1884.

SIR: I have the honor to transmit herewith, for the consideration of Congress, supplemental estimates for the fiscal year ending June 30, 1886, on account of the Indian service, as forwarded to this Department by the Secretary of the Interior, under date of the 26th ultimo, to wit:

Expenses, courts of Indian offenses	$50.000 00
Fulfilling treaties with Pottawatomies	227,851 38
Fulfilling treaties with Columbias and Colvilles	13,700 00
Total	291,551 38

Very respectfully,

H. McCULLOCH,
Secretary.

Hon. JOHN G. CARLISLE,
Speaker House of Representatives.

DEPARTMENT OF THE INTERIOR,
Washington, November 26, 1884.

SIR: I have the honor to transmit herewith a supplemental estimate of appropriations required for fulfilling treaty stipulations with certain Indian tribes, and for other purposes, for the fiscal year ending June 30, 1886, with the request that the same be transmitted to Congress for consideration in connection with the regular estimates for the Indian service for the fiscal year ending June 30, 1886.

Very respectfully,

H. M. TELLER,
Secretary.

The HON. SECRETARY OF THE TREASURY.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, D. C., November 25, 1884.

SIR: I have the honor to submit herewith, in duplicate, a supplemental estimate of appropriations required for fulfilling treaty stipulations with certain Indian tribes, and for other purposes, for the fiscal year ending June 30, 1886, with the recommendation that it be forwarded to the honorable the Secretary of the Treasury, with the request that the same be transmitted to Congress for consideration in connection with the regular estimates for the Indian service for the fiscal year ending June 30, 1886.

Very respectfully,

H. PRICE,
Commissioner.

The Hon. SECRETARY OF THE INTERIOR.

Supplemental estimates of appropriations required for the service of the fiscal year ending June 30, 1886, by the Indian Department.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.
EXPENSES, COURTS OF INDIAN OFFENSES.		
Salaries of 180 judges of courts of Indian offenses at sixty agencies, including incidental expenses connected therewith, at $833.33 for each agency (submitted)		$50,000 00
FULFILLING TREATIES WITH POTTAWATOMIES.		
This amount, being the sum found due to the Pottawatomie Nation by the two commissioners appointed by the President of the United States to examine and report to the Secretary of the Interior upon certain claims, in pursuance of the Senate amendment to article ten of the treaty of August seventh, eighteen hundred and sixty-eight: *Provided*, That out of these moneys the Secretary of the Interior shall reimburse the United States for moneys advanced in payment for the new reservation selected and set apart for said Indians in the Indian Territory: *Provided further*, That the said Pottawatomies shall be charged for said new reservation an amount equal to the sum paid by the United States to the Creek and Seminole Indians for the same; and the remainder of said sum shall be paid to said Indians per capita, or invested for their benefit, by the Secretary of the Interior as a permanent fund, according as said Indians may elect, per act of August 7, 1868, 15 Stat., pp. 533, 536, sec. 10		227,851 38
NOTE.—For explanation, see H. R. Report No. 1956, Forty-eighth Congress, first session.		
FULFILLING TREATIES WITH COLUMBIAS AND COLVILLES.		
Annuity for Chief Moses, as per agreement of July 7, 1883, ratified by act approved July 4, 1884, 23 Stat., p. 79, sec. 1	$1,000 00	
Annuity for Chief Tonacket, as per same agreement, and act of July 4, 1884, 23 Stat., p. 79, sec. 1	100 00	
Employés, as provided for in said agreement, per act of July 4, 1884, 23 Stat., p. 79, sec. 1	12,600 00	13,700 00
		291,551 38
NOTE.—For agreement, see Report Commissioner of Indian Affairs for 1883, page LXX.		

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 27.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

INCLOSING

Letter from the Second Auditor relative to additional accommodations required for his office, and making an increase of $1,200 *in the estimates for "rent of buildings."*

DECEMBER 11, 1884.—Referred to the Committee on Appropriations and ordered to be printed.

TREASURY DEPARTMENT,
December 10, 1884.

SIR: Referring to the item on page 29 of the Book of Estimates for 1886, under the head of "Contingent expenses, Treasury Department," for rent of buildings, $7,425, I have the honor to ask that the same be increased to $8,625, an increase of $1,200, to enable this Department to procure suitable additional accommodations for the office of the Second Auditor, the necessity for which is fully set forth in the accompanying copy of letter of the Second Auditor.

Very respectfully,

H. MCCULLOCH,
Secretary.

Hon. JOHN G. CARLISLE,
Speaker House of Representatives.

TREASURY DEPARTMENT,
SECOND AUDITOR'S OFFICE,
Washington, D. C., December 6, 1884.

SIR: I have the honor to report that in consequence of the crowded state of the rooms assigned to this office the clerical force cannot be properly accommodated. The office now occupies the third, fourth, and fifth floors of Winder's building, which is public property; the house on the southwest corner of Seventeenth and F streets, for which a rental of $1,800 per annum is paid, and the fourth and fifth floors of No. 610 Seventeenth street, at $825 per annum. The permanent files of the office, which consist of upward of fifty million pay-rolls and other valuable vouchers, already take up nearly one-half of all the rooms at my disposal and are constantly increasing in volume, more than fifty thousand vouchers being added every year. During the last five years the working force has been increased by fifty-one clerks, but there has been no corresponding increase in office room. The space gained by

placing a fire-proof roof on Winder's building, in 1881, and by renting two floors of No. 610 Seventeenth street, was imperatively needed for the files which then lined the corridors and endangered the safety of the building.

I urgently recommended that the sum of $1,200 be added to your estimate of the amount required for rent of buildings for the fiscal year ending June 30, 1886, to be used in procuring suitable additional accommodation for the office of the Second Auditor.

Very respectfully,

O. FERRISS,
Auditor.

The Hon. SECRETARY OF THE TREASURY.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 28.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

RELATING TO

An appropriation of $2,500 *for printing, binding, and distributing codified land laws and history of the public domain of the United States.*

DECEMBER 11, 1884.—Referred to the Committee on Appropriations and ordered to be printed.

TREASURY DEPARTMENT,
December 10, 1884.

SIR: I have the honor to submit herein for the consideration of Congress the following estimate of the Secretary of the Interior for an appropriation of $2,500, to wit:

For printing, binding, and distributing codified land laws and history of the public domain of the United States; to carry into effect joint resolution approved August 2, 1882 (22 Stat., p. 393), for the printing of additional copies of House Executive Document No. 47, and subsequent land laws.

Very respectfully,

H. McCULLOCH,
Secretary.

Hon. JOHN G. CARLISLE,
Speaker, House of Representatives.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 29.

BUREAU OF CATHOLIC MISSIONS FOR SUPPORT AND EDUCATION OF INDIAN PUPILS.

LETTER

FROM THE

ACTING SECRETARY OF THE INTERIOR,

WITH INCLOSURES,

Asking an appropriation of $2,000 *to Bureau of Catholic Missions for support and education of Indian pupils on Flathead Reservation, Montana.*

DECEMBER 12, 1884.—Referred to the Committee on Appropriations and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, December 11, 1884.

SIR: I have the honor to transmit herewith a copy of a communication of the 10th instant from the Commissioner of Indian Affairs, with inclosures noted therein, relative to a claim in the sum of $2,000, presented on the part of the Bureau of Catholic Missions of this city, on account of the support, education, &c., of twenty additional Indian pupils at the boys' school on the Flathead Reservation in Montana, under its control, during the fiscal year ending June 30, 1884, in excess of their contract for said year.

The correspondence fully explains the nature of the transaction, and an item in the sum above named is herewith submitted for incorporation in the Indian appropriation bill of the current session, or such other bill as may be deemed proper, to provide for the settlement of the said claim.

The matter has the recommendation of the Commissioner.

Very respectfully,

M. L. JOSLYN,
Acting Secretary.

The SPEAKER, HOUSE OF REPRESENTATIVES.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, December 10, 1884.

SIR: I have the honor to submit herewith copies of two letters, dated June 27 and November 28, 1884, respectively, from the Bureau of Catholic Indian Missions of this city, requesting payment of $2,000 on ac-

count of the support and education, &c., of twenty Indian pupils at the Indian Industrial Boys' School on the Flathead Reservation in Montana, the same being in excess of the number provided for by contract with this Department during the last fiscal year. In view of the statement submitted by the Catholic Bureau, I am of the opinion the request should be granted, and herewith respectfully submit an item for insertion in the appropriation bill for the current and contingent expenses of Indian Department, &c., for the year ending June 30, 1886, and respectfully recommend that the same be forwarded to Congress for that purpose.

Very respectfully, your obedient servant,

H. PRICE,
Commissioner.

The Hon. the SECRETARY OF THE INTERIOR.

THE BUREAU OF CATHOLIC INDIAN MISSIONS,
No. 1101 G STREET NORTHWEST,
Washington, D. C., June 27, 1884.

SIR: I desire to invite your very special attention to the matters following, to wit: On June 14, 1883, the late Rev. J. B. A. Brouillet, as director of this bureau, requested the honorable Commissioner of Indian Affairs, in due course, for a contract to support, educate, and maintain 50 Flathead Indian boys at the Flathead Indian mission in Montana for the fiscal year ending June 30, 1884. On July 2, 1883, the said father received from the honorable Commissioner of Indian Affairs, for execution, a contract for said 50 boys in his letter of June 30, 1883.

On July 5, 1883, said father executed and returned to the honorable Commissioner said contract.

On July 14, 1883, said father transmitted a copy thereof to Rev. Father Van Gorp, then superintendent of said Flathead Indian school, who governed himself accordingly, and made fitting accommodations to execute the same according to the contents and tenor thereof.

About that time the secretary of this bureau, Mr. Charles S. Lusk, called in person on the honorable Commissioner of Indian Affairs, to ascertain whether this contract (as well as those for other Indian schools in other portions of the Indian country then under the direction of this bureau) had been duly executed by the honorable Commissioner, when he learned that it had not been, but only because Miss Cook, of said bureau (whose duty, among other things, was to verify the contract), was then absent from the office on leave, and that the honorable Commissioner did not deem it best to execute the same until she returned and duly verified the said contract.

Mr. Lusk then asked the honorable Commissioner if there was any doubt as to all of said contracts being duly signed upon Miss Cook's return, and was informed that there was none.

By the date of Miss Cook's return from said leave the honorable Commissioner of Indian Affairs had received a report regarding said Flathead Indian school from Inspector Benedict, in which report said inspector recommended that only 30 boys be allowed in the contract for 1883–'84 for that particular school, and upon the plea that said school was a "money-making institution," &c.

On August 24, 1883, this bureau received a letter from the honorable Commissioner of Indian Affairs, dated August 21, 1883, stating that, owing to said report and said recommendation of said inspector, he had decided not to sign a contract for 50 boys, but to substitute a contract for only 30 boys, which contract be inclosed for execution.

On September 17, 1883, this bureau filed with the honorable Commissioner a letter, dated September 7, 1883, of Father Brouillet (he then being absent on duty among the Indians in the West), and also a letter of Maj. Charles S. Jones, treasurer of this bureau, requesting the honorable Commissioner to retain said contract at 50 boys.

September 19, 1883, the honorable Commissioner decided that he could allow only 30 boys at said school, and requested that contract for that number be executed.

September 30, 1883, this bureau filed with the honorable Commissioner of Indian Affairs said contract for 30 boys, as executed by Rev. Father Brouillet.

October 11, 1883, this bureau received said contract, duly executed by the honorable Commissioner.

On December 31, 1883, I had a personal interview with you on this same subject, and, in the absence of any valid reason appearing to the contrary, you then seemed to recognize the rightfulness of my request for 20 additional boys at said school during

the next half year, and suggested that my application be made in writing to the honorable Commissioner of Indian Affairs, and on the same date this bureau asked for a supplemental contract for said 20 boys for the six months ending June 30, 1884.

On January 10, 1884, the honorable Commissioner refused to grant said request, but agreed to consider the question of an increase of boys at said school at the beginning of the next fiscal year. Without now inquiring into the motives that led up to the statements contained in Inspector Benedict's report, or that justified the expression therein contained, that said school was a "money-making institution," your Department fully knows that, even if that statement were true (which I deny), in no event could the money of said institution, if it had any, have ever been realized from the United States for the clothing, feeding, educating, and supporting of an Indian pupil at $100 per year.

This institution, so called, among the Flatheads and allied tribes, has been in existence for nearly forty years, and has doubtless gathered around it all the external signs of thrift, progress, and success. This tribe of Indians now live in houses that the United States never erected; they now till the soil with implements which the United States never bought; they now own herds and now tend flocks the United States never supplied; their children are now taught in schools by teachers whom the United States only partially compensated, and in school buildings for the erection of which the United States never contributed a dollar. And the broad principles of right and morality taught these Indians have imbedded their flukes deep into the very hearts and souls of said Indians with but little assistance from the United States, and to such an extent that this bureau can give the lie to Inspector Benedict's reports by simply referring to the official statement of Senator Vest, of Missouri, whose report on his visit to said school we refer to and make part of this communication, and of his remarks in the Senate on this same subject, copy of which we also inclose you herewith. Nay, more: that there were Flathead Indian boys then and there to be educated is conclusively shown by the monthly school reports now of record in the office of the honorable Commissioner of Indian Affairs, and which records show that the attendance of boys at said school was as follows:

September, 1883	45
October, 1883	51
November, 1883	50
December, 1883	48
January, 1884	51
February, 1884	53
March, 1884	52
April, 1884	52
May, 1884	52
June, 1884	50

Making an average attendance for the ten months, or school year, of 50.4.

In addition thereto, the report of Indian Inspector Howard, subsequently made, does not substantiate said Benedict's statement. But, Mr. Secretary, this is not the principle or material factor in this case.

After this bureau had signified to Father Van Gorp the outline of his duty for the next year, to educate and maintain and support 50 boys, it was done, and done promptly; and had any instruction or intimation from this bureau been subsequently sent to that mission that the fathers then in charge had to return to their parents any 20 of said 50 boys, and thereby discriminate in favor of any 30 thereof, this bureau believes that it would have led up to serious disaffection, suspicion, and trouble, the consequences of which this bureau could not and would not be a party to, and might have led to results among those Indians that no $2,000 out of the Federal Treasury could have affected. In the interest of peace and harmony, and to keep faith with the Indians themselves (a rule which the fathers in the Indian country never infract, come what may), the fathers went on in good faith, and educated, supported, clothed, and fed 50 Indian boys, as the sisters had done in regard to the 50 girls; and they and we trusted that time and truth at the end of the year would bring with them their own vindication. This vindication has come, a vindication so full, clear, and overwhelmingly conclusive as to render Inspector Benedict's report unworthy a place in your public archives.

Evidence which you will respect shows that there were Indian boys to be educated, and the policy, nay, the principle, of your administration is to educate all who are capable of receiving education, and your records show that in good faith full 50 boys have been educated instead of 30; and in view of all these premises I plead, in the name of equity, in the name of right and of fair dealing, that you will recognize in this case the principle that "the laborer is worthy of his hire," and that as these fathers have educated, clothed, fed, and maintained, during the year ending June 30, 1884, 50 Flathead Indian boys at their said school, and have received the minimum compensation for only 30 thereof, you will now cause such steps to be taken as

shall secure for them a compensation for the maintenance and support of the remaining 20 Flathead Indian boys at the same rates at which the honorable Commissioner of Indian Affairs has already compensated them for the 30.

In all the foregoing, I believe the honorable Commissioner acted conscientiously and from all the best information he then had before him; but his information, I submit, was not then correct. Had he known at the beginning of the year to be true that which at the end of the year he is forced to admit to be true, there would have been no necessity for this or any like communication to you on this subject; and all of which is now respectfully submitted for your early and faithful consideration, and in the hope that no injustice be done those benefactors of humanity who, in the fastnesses of the Rocky Mountains, have heretofore aided, and are now aiding, you and the honorable Commissioner of Indian Affairs to administer the trust of the people in all that relates to the Indians confided to your keeping and under your supervision and control, in the interest of peace, civilization, and of the general welfare.

I am, Mr. Secretary, very truly, your obedient servant,

JOHN MULLAN,
Commissioner.

Hon. H. M. TELLER,
Secretary of the Interior.

THE BUREAU OF CATHOLIC INDIAN MISSIONS,
No. 1101 G STREET,
Washington, D. C., November 28, 1884.

SIR: I have the honor to state that the commissioner of this bureau, Capt. John Mullan, in a letter dated June 27 last, asked the honorable Secretary of the Interior to pay the Flathead Boys' Industrial School the sum of $2,000 for supporting and educating 20 Indian pupils in excess of the contract number during the fiscal year ending June 30, 1884; that this letter being referred to you, you, in a letter dated September 19 last, declined to grant such request, and that, in an interview subsequently held with you by the officers of this bureau, you agreed to recommend the payment of such claim by Congress.

I therefore now submit for your consideration the inclosed proposed amendment to the general deficiency bill, providing for the payment of such claim, and would respectfully ask, if it meets with your approval, that you transmit it to Congress with a favorable recommendation.

Very respectfully, your obedient servant,

CHAS. S. LUSK,
Secretary.

Hon. H. PRICE,
Commissioner of Indian Affairs.

AMENDMENT to be proposed to the bill making appropriations for the current and contingent expenses of the Indian Department, &c., for the year ending June 30, 1886, and for other purposes.

For payment, out of the unexpended balance of the appropriation for support of schools for the year 1884, to the Indian Industrial School for Boys on the Flathead Indian Reservation, for clothing, subsisting, maintaining, and educating 20 Indian pupils in excess of the number provided for by contract with the Indian Department, during the twelve months beginning July 1, 1883, and ending June 30, 1884, $2,000.

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48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 30.

RELIEF OF SURETIES OF GEORGE F. ELLIOTT.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

INCLOSING

Letter from the Commissioner of Internal Revenue in reference to bill S. 535, for the relief of the sureties of George F. Elliott, now on the Speaker's table.

DECEMBER 12, 1884.—Referred to the Committee on Ways and Means and ordered to be printed.

TREASURY DEPARTMENT, *December* 11, 1884.

SIR: I have the honor to inclose herewith a letter from the Commissioner of Internal Revenue of the 10th instant in reference to bill S. 535, for the relief of the sureties of George F. Elliott, which passed the Senate June 2, 1884, and is understood to be now lying on the Speaker's desk awaiting final action.

The main point of the case is that a judgment for $15,831.66 was obtained against said Elliott and sureties for *taxes* due the United States on whisky, and that all but $6,000 was collected, when stay of execution was granted to allow the defendants to apply to Congress for authority to remit the claim for said $6,000 on the ground that Elliott had paid that amount for a Tice meter.

The objection to granting this relief, as has been repeatedly stated in Department letters to both houses of Congress, as set forth in the Commissioner's letter, is that, if granted, all the purchasers of Tice meters, who paid their money directly to Tice, and not to the Government, would be equally entitled to relief, which Congress has persistently refused to grant.

Very respectfully,

H. MCCULLOCH,
Secretary.

Hon. JOHN G. CARLISLE,
Speaker of the House of Representatives.

TREASURY DEPARTMENT,
OFFICE OF INTERNAL REVENUE,
Washington, December 10, 1884.

SIR: I have the honor to submit the following facts and considerations with reference to a bill (S. 535) for the relief of the sureties of George F. Elliott, which passed the Senate June 2, 1884, and is now pending in the House of Representatives; and also with reference to a similar bill, H. R. 1263, with the same title, now pending in said House before its Committee on Claims.

The bill (S. 535) as it passed the Senate, authorizes and directs the Secretary of the Treasury "to allow to the legal representatives of William A. Elliott, deceased. and to Louis Sohngen, a credit of $6,000, of date of November 1, 1871, on a judgment taken and now pending against them as sureties for George F. Elliott in the United States circuit court for the southern district of Ohio, upon condition that the expenses incurred by the Government in prosecuting said claim shall first be paid by the defendants or their legal representatives."

The judgment here referred to was entirely for taxes due from and assessed against said George F. Elliott as a distiller. The assessment was in part collected by distraint and sale of the distillery property; and the distiller's bond, upon which William A. Elliott and Louis Sohngen were sureties, was put in suit for the balance due and a judgment for $15,831.66 was obtained at the October term of the court in 1871.

On the 24th of May, 1872, the United States district attorney was directed by the Solicitor of the Treasury to suspend collection of $6,000, pending the issue of an application to Congress for relief as regarded the matter of the Tice meters, provided the balance was forthwith paid. United States District Attorney Richards reported, under date of September 13, 1881, that "after some delay the condition was complied with, and the marshal returned the execution he held satisfied less abatement made by order of United States District Attorney Bateman of $6,000."

So the matter stood until 1878, when the Solicitor of the Treasury revoked the order of suspension and directed the district attorney to collect the balance of the judgment, whereupon execution was issued, but it was returned *nulla bona*.

It appears, therefore, that the judgment has all been paid except the sum of $6,000. And it is alleged that an expense of $6,000 was incurred by the distiller in the purchase of Tice meters, required by the regulations, made in accordance with express provisions of law (see section 3, act of July 20, 1868), but which meters, it is stated, were never used; and it is claimed that this amount, alleged to have been paid, should be credited on the judgment.

In regard to these meters I would state that the amount paid does not constitute any valid claim against the United States. (See the decision of the Supreme Court in Finch & Co., appellants, *vs.* The United States, 12 Otto, 269.)

It is represented that George F. Elliott, the principal, is insolvent, and has been since 1870; that William A. Elliott died in 1881; that Sohngen and William A. Elliott were under the impression that the case was settled and the $6,000 abated.

In 1881 the case was brought to the attention of the officers of the Government, and efforts were made, with good prospects of success, to collect from the sureties the $6,000 and interest remaining due on the judgment.

But on the 30th of January, 1882, a bill (S. 1023), somewhat similar to the bills first hereinabove mentioned, and with the same title, was introduced in the Senate by Mr. Voorhees and referred to the Committee on Finance. On the 28th of January, two days previously, District Attorney Richards was authorized by this office to suspend proceedings for collection of the judgment until the close of the then current session of Congress.

On the 23d of February, 1882, this office addressed a communication giving a history of the case to the then Secretary of the Treasury, in response to a letter of inquiry from the Senate Committee on Finance to the Secretary, dated February 14, 1882, and in compliance with the Secretary's request to the Commissioner indorsed on said letter. In this report of February 23, 1882, the Commissioner expressly stated that the judgment in question "was for taxes assessed against George F. Elliott." He also stated as follows:

> The collection of the amount due from the surviving surety now, after the lapse of so long a time, when the Government seems to have rested in its efforts to collect the claim, may seem hard, although the parties should have understood that the Government only suspended its efforts to collect the whole judgment, and had not compromised it.
>
> I inclose a copy of a letter, dated the 6th instant, from H. R. Probasco, esq., who has been employed in looking up old claims on the part of the Government, and through whose efforts property is now discovered, as alleged, from which this debt can be collected. Congress has not granted relief in other cases on account of the amount of money expended by distillers in procuring Tice meters, as far as I am aware, and I do not think that relief should be afforded on that account in this case. There are no other reasons for relieving the surviving surety from the operation of the judgment which do not apparently apply to sureties generally who, upon default of the principal, are obliged to pay the amount for which they become responsible, unless it be that, by the action of the officers of the Government, the parties were led o believe that the matter was settled.

A copy of this report of the Commissioner was transmitted by the Secretary to the Hon. J. S. Morrill, chairman Committee on Finance, United States Senate, on the 25th of February, 1882.

On the 7th of August, 1882, Mr. Sherman, from the Senate Committee on Finance, submitted a report (No. 877), in which it was stated that $9,831.66 of the judgment for $15,831.66 was on account of taxes due the Government, "*the remaining* $6,000 *being on account of a meter which was never in use in the distillery.*"

This was a mistake. The whole judgment of $15,831.66 was for that amount of taxes due from George F. Elliott as a distiller. The judgment had no relation whatever to the meter or meters purchased by Elliott. Money due for meters purchased by distillers was not due to the Government, but to the meter manufacturers from whom the purchase was made; and, in the present case, whatever money Elliott paid for meters was not paid to the Government, but to the meter manufacturers, from whom he purchased them.

When, on the 7th August, 1882, the Finance Committee's report aforesaid was presented, as appears from the narrative in the Congressional Record of the proceedings of the Senate on that date, the report was not read, but, on Mr. Saulsbury requesting an explanation of the bill, S. 1023, the passage of which was proposed, Mr. Sherman, after Mr. Voorhees had said "Let the report be read," spoke as follows:

> The report is too long to be read at this time, and I can state the case in a moment. There was a judgment recovered against Sohngen and his sureties for about $15,000 or $16,000. There was $6,000 of it for a meter, which was never put in the distillery. It was suspended by the Treasury Department from May, 1872, I think, until recently. In the mean time the principal died, and the sureties paid all that was demanded, some nine thousand and odd hundred dollars. He died leaving a small estate, a widow, and some children. The Committee on Finance, after careful examination of

the question, thought it was inequitable, after the lapse of ten years, to revive the claim of $6,000 against the sureties, who are in poor condition. The Senator from Indiana knows more about the details, but these are the general facts.

Mr. Saulsbury said:

I did not object to the bill. I only wanted an explanation.

Mr. Sherman responded:

Those are the general facts.

Whereupon, after certain amendments were agreed to, as proposed by the Finance Committee, which made the bill read as S. 535 aforesaid now reads, "the bill was ordered to be engrossed for a third reading, read the third time, and passed."

It will be seen that the bill was passed by the Senate on the mistaken statement of facts presented as above.

On the 20th December, 1882, the Secretary of the Treasury addressed a letter to the Speaker of the House of Representatives, referring to the passage by the Senate of bill S. 1023, stating the results that would follow if the bill should become a law, and calling attention to the fact that, while the judgment was in fact entirely for taxes due by Elliott to the Government, amounting to $15,831.66, "by some inadvertence it was reported to the Senate that the judgment was for $9,831.66 taxes, and the balance, $6,000, for the meter, and on this statement the bill was passed."

The Secretary's letter closed as follows:

> On the 18th of May last [1882] a letter from this Department was addressed to Hon. William D. Kelley, Chairman of the Committee on Ways and Means, which, with the documents then inclosed, gave a full history of the case. In that letter it was stated that there was no good reason for granting relief in this case unless Congress should decide to give relief to all purchasers of the Tice meter, which thus far had not been granted, although strenuous efforts had been made to that end. If this bill should become a law it would be a precedent for opening the door to all other purchasers of the Tice meter.

The Forty-seventh Congress expired without the House of Representatives having acted on the bill in question.

But soon after the beginning of the first session of the Forty-eighth Congress, to wit, on the 10th of December, 1883, Mr. Voorhees introduced into the Senate the bill S. 535, first hereinbefore mentioned, which was referred to the Committee on Finance, and on the next day a similar bill, H. R. 1263, with the same title, was introduced into the House of Representatives by Mr. Morey and referred to the Committee on Claims.

On the 24th of January, 1884, this office addressed a letter to the Secretary of the Treasury, inclosing a copy of Commissioner Raum's report of the case, dated February 23, 1882, before mentioned, and referring to the mistake of fact made in the Senate Finance Committee's report submitted August 7, 1882, as aforesaid, with reference to $6,000 of the judgment being on account of a meter, when in truth the whole judgment of $15,831.66 was for taxes due the Government; and calling attention to the danger of making such a precedent as the passage of this bill would be, for a multitude of claims that would follow for the refunding by the United States to the distillers of the amounts paid by them, not to the Government, but to the meter manufacturers for meters purchased by them from such manufacturers.

On the 28th of January, 1884, the Acting Secretary of the Treasury addressed a letter to the Hon. J. S. Morrill, chairman of the Senate

Committee on Finance, transmitting copies of the beforementioned two letters of this office, dated respectively February 23, 1882, and January 24, 1884, and also referred to the two other letters from the Secretary of May 18, 1882, and December 20, 1882, hereinbefore referred to.

The Acting Secretary on the same date addressed a similar letter, inclosing similar copies, to Hon. Benton McMillin, chairman of the Committee on Claims of the House of Representatives.

Notwithstanding these repeated efforts to bring the main fact of this case to the attention of the respective Committees of Congress before whom the bills in question were pending, there seems to have been a failure of success in those efforts in the case of the Senate Committee on Finance; for, on the 1st day of April, 1884, there was submitted to the Senate by Mr. Voorhees, from the Committee on Finance, a precisely similar report, No. 408, to that made August 7, 1882, No. 877, by Mr. Sherman, and with the same incorrect statement as to $6,000 of the judgment having been for a meter, to the incorrectness of which this office and the Secretary's office had repeatedly called attention, as hereinbefore narrated.

Soon after this last incorrect report was made, viz, on the 10th of the same month of April, 1884, the late Secretary, Hon. Charles J. Folger, addressed a communication to the Hon. Justin S. Morrill, chairman of the Senate Committee on Finance, asking his attention to the error of fact contained in said report, No. 408 (inclosing a copy of that report), and explaining the nature of the error, stating also the objections to granting the relief proposed, and adding:

> This matter was fully explained in letters of the Commissioner of Internal Revenue of February 23, 1882, and January 24, 1884, copies of which were sent you with my letter of January 28, 1884.

Nevertheless, on the 2d of June, 1884, when the bill in question, S. 535, came before the Senate for consideration, it was passed in the following manner, as stated in the Congressional Record:

Mr. Groome said:

> I should like to hear the report read, or to have some explanation made of the bill.

The presiding officer directed the report to be read.

Thereupon the Secretary "read the report submitted by Mr. Voorhees April 1, 1884." Then follows in the Record a copy of the report No. 408, and it is thereupon added:

> The bill was ordered to be engrossed for a third reading, read the third time, and passed.

It will thus be seen that for the second time the Senate passed the bill in question on the incorrect statement made in the report.

The bill was sent from the Senate to the House of Representatives, in which it is now pending, being, as I understand, on the Speaker's table, from which it would seem that it may be taken and passed by the House without further reference. As hereinbefore stated, there is also pending in the House of Representatives, before its Committee on Claims, the bill H. R. 1263, of the same title and substance as said bill S. 535.

I have now the honor to suggest that, in such way as may seem best to you, the attention of the House of Representatives may be called to the important mistake as to the aforesaid $6,000 contained in the Sen-

ate Finance Committee's report, No. 408, in order that bill S. 535, for the relief of the sureties of George F. Elliott, now on the Speaker's table, may not be passed in the House of Representatives under the same mistake, as to the most important fact in the case which appears to have caused its passage in the Senate.

Very respectfully,

WALTER EVANS,
Commissioner.

Hon. HUGH MCCULLOCH,
Secretary of the Treasury.

O

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 31.

REPORT FROM THE COMMISSIONER OF INDIAN AFFAIRS.

LETTER

FROM THE

ACTING SECRETARY OF THE INTERIOR,

TRANSMITTING

Report from the Commissioner of Indian Affairs, with accompanying papers, and recommending the passage of a bill granting the right of way to the Jamestown and Northern Railway Company through the Devil's Lake Indian Reservation, Dakota.

DECEMBER 15, 1884.—Referred to the Committee on Indian Affairs and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, December 12, 1884.

SIR: I have [the honor] to transmit herewith copy of report of the 11th instant from the Commissioner of Indian Affairs, with accompanying papers, upon the subject of the right of way required by the Jamestown and Northern Railway Company through the Devil's Lake Indian Reservation in Dakota, together with a draft of a bill prepared in the Office of Indian Affairs for the purpose of granting such right of way.

Concurring in the recommendation of the Commissioner, the subject is respectfully presented for the consideration and action of the Congress.

Very respectfully,

M. L. JOSLYN,
Acting Secretary.

The SPEAKER *of the House of Representatives.*

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, D. C., December 11, 1884.

SIR: In the matter of the right of way required by the Jamestown and Northern Railroad Company through the Devil's Lake Indian Reservation in Dakota, and in compliance with Department instructions of May 2 last, directing the preparation of a full history of the case, with

the papers on the subject and recommendations to the Department for transmission to Congress for the action of that body, I have the honor to submit the following statement:

The second article of the treaty with the Sisseton and Wahpeton bands of Dakota or Sioux Indians, concluded February 19, 1867, duly ratified and proclaimed (15 Stat., 506), provides:

> The said bands hereby cede to the United States the right to construct wagon roads, railroads, mail stations, telegraph lines, and such other public improvements as the interest of the Government may require over and across the lands claimed by said bands (including their reservation as hereinafter designated) over any route or routes that may be selected by authority of the Government. * * *

The fourth article of the same treaty defines a reservation to be set apart "for all other members of said bands who were not sent to the Crow Creek Reservation, and also for the Cut-Head bands of Yanktonnais Sioux," as follows:

> Beginning at the most easterly point of Devil's Lake, thence along the waters of said lake to the most westerly point of the same; thence on a direct line to the nearest point on the Cheyenne River; thence down said river to a point opposite the lower end of Aspen Island; and thence on a direct line to the place of beginning.

On the 6th June, 1883, the Department referred to this office for report a map filed by the Jamestown and Northern Railroad Company, showing the definite location of its line of road from a point on the northern line of Stutsman County, Dakota, to a point at the west end of Devil's Lake, in Ramsey County, Dakota, passing through the Devil's Lake Reservation.

In reporting upon said map (June 16, 1883), this office recommended that action be taken similar to that authorized by the Department in 1880 in the case of the applications of the Travare and Jamestown Railroad Company, and the Chicago, Milwaukee and Saint Paul Railway Company, for right of way across the Lake Traverse (Sisseton and Wahpeton) reserve, established under the same treaty for other bands of said Indians, and that the agent at Devil's Lake be directed to convene a council of the Indians for the purpose of arranging the measure of compensation to be paid to them by the company for the privilege required.

Under date June 26, 1883, the Department concurred in this recommendation, and directed this office to take the necessary steps to carry the same into effect.

In the mean time a question had arisen as to the accuracy of the existing western, boundary lines of the reservation, pending determination of which, as materially affecting the quantity of land required for the proposed right of way, further action by this office was suspended. After an investigation by the General Land Office, the Department decided, under date of September 18, 1883, that no change would be made in the western boundary line of the reservation as already established.

On the 6th August, 1883, Agent Cramsie, in charge of Devil's Lake Agency, transmitted to this office a proposition submitted to him by F. R. Delano, authorized agent of the Jamestown Northern Branch of the Northern Pacific Railroad, on the 26th July previous, for a right of way 200 feet wide (estimated area 173 acres, more or less) across the Devil's Lake reserve, upon the following terms, viz:

1. To pay the sum of $5 cash per acre for the lands required for right of way, in such manner as the proper officer of the Indian Department shall designate.

2. To locate, construct, and maintain at a convenient point on said railroad a side-track and station-house depot for doing the necessary

railroad business of the Indian agency and reservation, and of the War Department, as connected with the military business of Fort Totten; the said side-track and station depot to be located for the convenience of the agency and fort, at such point as the Indian agent and railroad company's agent may agree upon.

Accompanying Agent Cramsie's letter was a memorandum in writing, signed by some sixty-six Indians, representing a majority of the chiefs and head-men of the Devil's Lake Indians, consenting to a right of way for said railroad upon the following modified conditions, viz:

That the compensation to be paid for the lands required by the Jamestown and Northern Railroad Company shall be at the rate of $10 per acre, instead of $5 as proposed, and with the understanding that a station depot and suitable building for storage of Government property shall be erected at a point on said railroad to be designated by their (the Indians') agent, and that no other buildings or persons, except said depot and warehouse, and the necessary employés of the railroad for the transaction of the Government business on the road, shall be located at said point or within the boundary of the reservation. (See inclosure No. 1.)

Upon receipt of this communication, this office addressed a letter to George H. Adams, esq., president of the Jamestown and Northern Railroad Company, on the 29th September, 1883, inclosing a copy of the proposition submitted to the Indians by the special agent of the Northern Pacific Railroad Company as above, with a copy of the resolution of the Indians thereon, and requested him to inform this office whether the Jamestown and Northern Railroad Company was willing to accept the modified conditions, and, in the event of acceptance, to file in this office a duly-certified plat of definite location of the grounds designated for station-house and storage buildings for Government property. (See inclosure No. 2).

On the 8th December, 1883, President Adams replied, transmitting to this office—

1. A certified copy of a resolution of the board of directors of the Jamestown and Northern Railroad Company, adopted October 5, 1883, accepting the conditions imposed by the Indians as set forth in the memorandum above cited, and authorizing the president of the company to notify the Department of such acceptance, and on behalf of the company to enter into such contracts or otherwise as may be necessary to carry out the intent of said resolution.

2. A certified copy of a resolution of the board of directors of said company, adopted December 4, 1883, approving and adopting the map of survey prepared by the chief engineer of the company, and submitted to the board, dated November 24, 1883 (next hereinafter mentioned), as and for the location of the company's railroad between the points therein specified, and as and for the right of way and grounds for station buildings and depot grounds, and authorizing the president of the company to provide the necessary funds, amounting to the sum of $1,845, and in behalf of the company to pay the same into the Department of the Interior, or otherwise to dispose of the same for the benefit of said Indians as shall be deemed advisable by the Department.

3. A certified map, in duplicate, of definite location of the line of the Jamestown and Northern Railroad through the Devil's Lake Reservation from the crossing of Cheyenne River, in section 5, township 150 north, of range 66 west of the fifth principal meridian, to a point in the town of Minnewaukan, in section 15, township 153 north, of range 67 west of the same meridian, in the Territory of Dakota, a distance of

17 miles; also a plat of the surveyed limits and area of grounds selected by said railroad company for station buildings and depot grounds within said reservation, situated in sections 15 and 22, township 152 north, of range 67 west; together with certificate, under oath, thereon indorsed, of the surveyor of said company as to the number of acres comprehended within the right of way (177.6 acres) and station and depot grounds (6.89 acres), amounting in the whole to 184.5 acres. (See inclosure No. 3.)

On the 15th December, 1883, this office transmitted to Agent Cramsie a tracing from the map filed by said railroad company, showing the location of the grounds selected for station and depot purposes, with instructions to report whether such location was a suitable one for the requirements of the agency.

On the 9th January, 1884, Agent Cramsie replied that he approved of the location as described. (See inclosure No. 4.)

By letter of March 1, 1884, President Adams informed this office that the Jamestown and Northern Railroad Company had appropriated and set apart the sum of $1,845 as compensation money to be paid to the Indians for their interest in the lands required for the purposes of the road, and requested to be advised as to the manner in which the money should be paid, and what further papers would be required to be executed by the company. (See inclosure No. 5.)

By Department letter of March 10, 1883, this office was instructed as follows:

> In all cases where right of way for railroads through Indian reservations is not provided for by treaties or agreements by the United States with the Indians, Congressional action is necessary to ratify agreements by railway companies with the Indians for such right of way, &c.

The language of the treaty with the Devil's Lake Indians in regard to right of way for railroads through their reservation is peculiar, and differs from that of many other treaties with Indian tribes in that the right to construct railroads, &c., is reserved to the United States alone.

The second article of the treaty (15 Stat., 506) reads thus:

> The said bands hereby cede to the United States the right to construct wagon-roads, railroads, mail stations, telegraph lines, and such other public improvements as the interests of the Government may require, over and across the lands claimed by said bands (including their reservation as hereinafter designated) over any route or routes that may be selected by authority of the Government. * * *

Viewed as an entirety, it may be argued that it was the intention of this clause to grant a right of way for any properly incorporated railroad through the reservation whose line of route may have received the approval of the proper Executive Department of the Government, and in that view no further legislation would be necessary.

On the other hand, if the privilege reserved is in the United States alone, then I apprehend Congressional action will be required in order to confirm a right of way to the company applicant. Upon that assumption, as probably the safest and best, I have had prepared the draft of a bill to carry out the proposed arrangement with the Jamestown and Northern Railroad Company, which, with copies of all material papers in the case, is herewith submitted, with the recommendation that it be transmitted to the Congress for its consideration and action.

Very respectfully, your obedient servant,

H. PRICE,
Commissioner.

The Hon. the SECRETARY OF THE INTERIOR.

No. 1.

UNITED STATES INDIAN SERVICE,
Devil's Lake Agency, August 6, 1883.

SIR: I have the honor to inclose for your information proposition of F. R. Delano, authorized agent of the Jamestown Northern Branch of the Northern Pacific Railroad, for a right of way across the reservation of these Indians, also the accompanying map showing the route and proposed location of said road.

On my return from Fargo I called the Indians together and explained to them the proposition of the railroad company, to which they agreed and subscribed, on condition that the sum to be paid for the land be $10 per acre instead of $5, the money realized from the sale of said lands to the railroad company to be deposited with the Commissioner of Indian Affairs to the credit of the Indians of the Devil's Lake Reservation, and to be expended by their agent in the purchase, in open market, of farm machinery and work animals for the benefit of said Indians; and that in addition to the "station-house, depot, and side-track" a warehouse of suitable dimensions be erected to properly store and protect all Government stores consigned to said station for a reasonable length of time, and that no other buildings or persons shall be located or reside at said station except the aforesaid buildings and necessary employés of the road to conduct the Government business of said station.

I am, sir, very respectfully, your obedient servant,

JOHN W. CRAMSIE,
United States Indian Agent.

Hon. H. PRICE,
Commissioner of Indian Affairs, Washington, D. C.

UNITED STATES SERVICE,
Devil's Lake Agency, July 28, 1883.

SIR: The undersigned, as special agent of the Northern Pacific Railroad Company for the purpose of adjusting and settling for the right of way over, upon and across the Indian reservation of Devil's Lake for locating, constructing, and operating the Jamestown Northern Branch of the said Northern Pacific Railroad on said reservation, submit the following proposition in regard thereto for the consideration of yourself and all parties whom it may concern, to wit:

Said railroad is located in the westerly part of said reservation, running from the Cheyenne River to the west end of Devil's Lake, a distance of about 18 miles.

The quantity of land required is a strip 200 feet in width, being 100 feet wide on east side of the center line of said railroad.

The quantity of land contained in said strip, if the present west line of the said reservation is maintained, will be 178 acres, more or less.

If the said west line is re-established farther west, so that the line of said railroad will be entirely located in said reservation, then the quantity of land required will be 445 acres, more or less.

In consideration therefor, and for payment for said land, the said railroad company will pay the sum of $5 per acre for all the land so taken in said reservation, the said sum to be paid in cash at such time, in such place, and to such person as the proper officer of the Indian Department shall designate; will also locate, construct, and maintain, at a convenient point on said railroad, a side-track and station-house depot, for doing the necessary railroad business of the Indian Agency and reservation, and of the War Department as connected with the military business of Fort Totten; the said side-track and station-depot to be located, for the convenience of the agency and fort, at such point as the Indian agent and the railroad company may agree.

The map herewith filed shows by the red line marked thereon the proposed location of said railroad as it is located on said reservation.

Respectfully submitted.

For the NORTHERN PACIFIC RAILROAD COMPANY,
By F. R. DELANO,
Special Agent for Right of Way.

Maj. J. W. CRAMSIE,
Indian Agent.

We, the undersigned Indians of the Devil's Lake Indian Reservation, having had explained to us the annexed proposition of F. R. Delano on behalf of the Northern Pacific Railroad Company for a right of way across our reservation, do hereby give our consent to the said right of way, provided the compensation therefor be $10 per acre instead of $5, as proposed, and with the understanding that a station depot and a suitable building for storage of Government property be erected at a point on said railroad to be designated by our agent, and that no other buildings, or persons, employés of said railroad, except said depot and warehouse and the necessary employés

of the railroad for the transaction of the Government business on said road, shall be located at said point or within the boundary of the reservation now or hereafter to be decided upon.

TIOWASTE,	his x mark.	TATANKAIYESU,	his x mark.
ICANAPEKA,	his x mark.	TAWACIHOMINA,	his x mark.
WANANATA,	his x mark.	HAPAHUWASTE,	his x mark.
MATOCATKA,	his x mark.	WAKAKOYAKE,	his x mark.
IPAGEMANI.		HUPAHUKOKEPAPI,	his x mark.
HEWAJI,		CAHMDISKAKOYAGENAJI,	his x mark.
KAPOJA,	his x mark.	WAHACAUKATO,	his x mark.
HAHAKAITIWAKA,	his x mark.	OTAKOYAKE,	his x mark.
CADUZEE,	his x mark.	TATEWANAHO,	his x mark.
WAHACAKADUTA,	his x mark.	TATEHOTA,	his x mark.
OSPEUKAGE,	his x mark.	PTEPA,	his x mark.
MATOWAKA,	his x mark.	MAHPUYAPETA,	his x mark.
ICAPTAKE,	his x mark.	HAHA,	his x mark.
WYAKAMAZA,	his x mark.	WICAHENAPI,	his x mark.
MATOHAKEKTU,	his x mark.	MINEYETEHOWASTE,	his x mark.
WYAKANAPI,	his x mark.	IICAHMAIN,	his x mark.
TATANKAZU,	his x mark.	WAKAHWHIWASTE,	his x mark.
CAHNDESKAMAZA,	his x mark.	TAKAWYEFMAIN,	his x mark.
WAKANKETA,	his x mark.	MATOHETO,	his x mark.
ENAMUSAPA,	his x mark.	HUPAHUHANSKA,	his x mark.
HOTOHOWASTE,	his x mark.	WICAHPEWAKA,	his x mark.
HEHAKAWAJINA,	his x mark.	NAPETANKA,	his x mark.
MAHPEYAOHITIKA,	his x mark.	SINTICAHODMANI,	his x mark.
HOGAYUTSENA,	his x mark.	AKICITAANTA,	his x mark.
HUNUGAKE,	his x mark.	HUDNAJE,	his x mark.
ZITKANAWASTE,	his x mark.	WEAKAWAJENA,	his x mark.
ILICE,	his x mark.	HAPAHUWAKANKA,	his x mark.
WAKAWYAKAPI,	his x mark.	HEHAKAMAZA,	his x mark.
POGETANKA,	his x mark.	CANUPESA,	his x mark.
WASUKEGA,	his x mark.	HENRY KEYA,	his x mark.
IHAWYAKAPI,	his x mark.	TASUNKAWYAKAPI,	his x mark.
WAHAMUHADUTA,	his x mark.	CASKEHANSKA,	his x mark.

I certify on honor that the signatures appended hereto represent a majority of the chiefs and headmen of the Indians of the Devil's Lake Reservation.

JOHN W. CRAMSIE,
United States Indian Agent.

I certify on honor that I have explained to the Indians herein named and am satisfied that they fully understand the nature of the proposition hereto annexed, made by Mr. F. R. Delano, and that I have also explained to them and am satisfied that they fully understand the nature of their consent to said proposition, as contained in sheet No. 5 of these papers.

N. J. CRAMSIE,
Interpreter.

We, the undersigned, hereby certify on honor that we were present and witnessed the signing of the paper by each individual herein named.

THOMAS H. BREEN, *M. D.*
JOHN W. CRAMSIE.

No. 2.

DEPARTMENT OF THE INTERIOR,
OFFICE INDIAN AFFAIRS,
September 29, 1883.

SIR: Referring to the question of the right of way for the Jamestown and Northern Railroad through the Devil's Lake Indian Reservation in Dakota, as indicated on the map of definite location filed by you in this Department, April 10 last, I inclose herewith a copy of a proposition submitted to the agent at Devil's Lake Agency, by F. R. Delano, special agent of the Northern Pacific Railroad Company, on the 28th of July last, offering to pay the sum of $5 per acre for all lands of said reservation taken in the construction of the Jamestown Northern Branch of the Northern Pacific Railroad thereon; also to locate, construct, and maintain at a convenient point on said

railroad a side track and station-house depot for doing the necessary railroad business of the Indian agency and reservation, and of the War Department as connected with the military business of Fort Totten, said side track and station depot to be located for the convenience of the agency and fort at such point as the Indian agent and the railroad company's agent may agree.

I also inclose a copy of the resolutions of the Indians thereon consenting to the right of way provided the compensation therefor be $10 per acre instead of $5, as proposed, and with the understanding that a station depot and a suitable building for storage of Government property be erected at a point on the railroad to be designated by the Indian agent, and that no other buildings or persons except said depot and warehouse and the necessary employés of the railroad for transaction of the Government business on the road shall be located at said point or within the boundary of the reservation now or hereafter to be decided upon.

In order to save time, I shall be obliged by your informing me whether the Jamestown and Northern Railroad Company is willing to accept the modified conditions imposed by the Indians, in order that the necessary formal papers may be prepared and signed by the Indians and thereafter submitted to the Secretary of the Interior for his approval.

In the event of your acceptance of said conditions, it will be necessary that the location of the grounds for station house and storage building for Government property should be ascertained and a duly certified plat thereof filed in this office for reference in connection with the instrument to be prepared, evidencing consent of the Indians to the right of way, &c.

It is proper to add for your information that under date of the 18th instant, the honorable Secretary of the Interior decided that the existing western boundary line of the reservation as established in 1875 will remain unchanged.

I will also thank you to furnish this office with a description of the route taken by the railroad through the reservation, including points of entry and exit, &c.

Very respectfully,

E. L. STEVENS,
Acting Commissioner.

GEORGE H. ADAMS, Esq.,
President Jamestown and Northern Railroad Company,
Mill's Building, Broad Street, New York, N. Y.

No. 3.

JAMESTOWN AND NORTHERN RAILROAD COMPANY,
MILLS BUILDING, BROAD STREET,
New York, December 8, 1883.

DEAR SIR: Referring to the question of the right of way for the Jamestown and Northern Railroad Company through the Devil's Lake Indian Reservation in Dakota, mentioned in your communication, L 14,815–1883, of date September 29, 1883, I have the honor to state that the Jamestown and Northern Railroad Company has by resolution of its board of directors, adopted on the 5th day of October, 1883, and the 4th day of December, 1883, accepted and approved the proposition of F. R. Delano made to said Indians, as modified by the agreement signed by said Indians of the date of the 28th of July, 1883.

A map of the definite location of the line of the railroad through the reservation has been prepared and certified according to law, showing the boundaries of the right of way proposed to be taken through the reservation, and also showing the boundaries of the grounds proposed to be taken for station grounds and depot buildings, the latter having been determined upon, as I am informed by the chief engineer, with the approval of the local Indian agent. The map also contains a certificate under oath of the chief engineer as to the number of acres comprehended within the right of way and said station and depot grounds, for which, under the agreement with said Indians, the company is to pay at the rate of $10 per acre, amounting in all to 184.5 acres.

I inclose herewith a certified copy of the resolutions of the board of directors of this company referred to above as having been adopted on the 5th day of October and the 4th day of December, 1883. I also forward to you to-day by express two duplicate originals of certified map of location of said line and right of way and station and depot grounds referred to above.

I beg to be informed what further deeds, if any, or agreements will be required by the Department between this company and said Indians, and whether such deeds, if required, will be prepared in your office or otherwise.

I desire to say, further, that I am prepared to pay into the Department or to the Indian agent or to the Indians themselves, as the Department shall require, the con-

sideration money, viz, $1,845, and request that you will at your convenience state where and when and in what manner this consideration money shall be paid.

I remain, very respectfully,

GEORGE H. ADAMS,
President Jamestown and Northern Railroad Company.

E. L. STEVENS, Esq.,
Acting Commissioner, Washington, D. C.

OFFICE OF THE JAMESTOWN AND NORTHERN RAILROAD COMPANY,
New York, December 5, 1883.

I hereby certify that at a regular meeting of the board of directors of the Jamestown and Northern Railroad Company held at the offices of said company at the city of New York on the 5th day of October, 1883, the following proceedings were had and the following resolutions were adopted, viz:

"The president of the company stated to the board that questions had arisen as to the location of the main line of this company through the Indian reservation near Devil's Lake, in Dakota, and that propositions on behalf of the company had been made to the Indians with the consent of the authorities of the United States for an authorization to pass through said reservation, and that this proposition somewhat modified had been acceded to by the Indians with the consent of the United States.

"The president further stated that he had received notice of the action of the Indians through the Department of the Interior with a request that the company notify the Department of its assent to the agreement signed by the Indians.

"Thereupon on motion of James B. Fry, seconded by Charles A. Spofford, the following preamble and resolutions were adopted:

"Whereas the line of this company necessarily passes through the reservation of the Devil's Lake Indians at the west side of Devil's Lake in the Territory of Dakota, and it is necessary to obtain from the Indians occupying said reservation an authorization for the location of the line of the railroad through their reservation.

"And whereas said Indians have signed a contract whereby they agree to the location of said line and to the occupation by the company of a right of way of two hundred feet wide through said reservation upon the company's paying at the rate of $10 per acre for every acre included within said right of way, and upon the further condition that the company will build at the place to be agreed upon a suitable warehouse or depot for Government supplies, and upon the further condition that the company will erect no buildings and will have no employés within said reservation except such as are necessary for the usual operation of the road: Now, therefore,

"*Resolved*, That said proposition be, and the same hereby is, by this company accepted, and that the president of the company be authorized to notify the Department of the Interior of the United States of such acceptance, and that the president and secetary of the company enter into in the name of the company such contract or contracts in writing or otherwise as may be necessary and proper to carry out the intent of these resolutions."

In witness whereof I, Sidney Starbuck, the secretary of said Jamestown and North ern Railroad Company, duly authorized thereto by the board of directors of said company, set my hand and the official seal of said company the day and year first above written.

[SEAL.]

SIDNEY STARBUCK,
Secretary of the Jamestown and Northern Railroad Company.

OFFICE OF THE JAMESTOWN AND NORTHERN RAILROAD COMPANY,
New York, December 5, 1883.

I hereby certify that at a regular meeting of the board of directors of the Jamestown and Northern Railroad Company held at the offices of said company at the city of New York on the 4th day of December, 1883, the following proceedings were had and the following resolutions were adopted, viz:

"The president submitted to the board a map of the railroad of this company through the Devil's Lake Indian Reservation, and of the land to be occupied by said portion of the road and the station-house on said reservations now on motion of Mr. Tyndale, seconded by Mr. Fry, the following resolution was adopted:

"The chief engineer having prepared the map of the survey of a portion of this company's railroad dated November 24, 1883, whereon is indicated the route of said railroad through the Devil's Lake Indian Reservation, and also the station buildings and depot grounds on said reservation, and said route being from the crossing of Cheyenne River in section 5, township 150 north of range 66 west of the 5th principal meridian, to a point in the town of Minnewaukan in section 15, township 153 north of range 67 west of the same meridian, in the Territory of Dakota, a distance of 17 miles, and said right of way therein indicated being 100 feet on each side of the center line of said line of railroad, and amounting to 177.6 acres of land, and the sur-

veyed limits and area of the ground selected for station buildings and depot grounds of this company within said reservation are 6.89 acres of land, and is situated in sections 15 and 22, township 152 north of range 67 west.

"And the said map and locations thereon of said lines of railroad and right of way, and of the said ground for station building and depot grounds, being carefully examined and fully considered,

"*Resolved*, That the said survey and map are hereby approved, and that the said lines of survey, and of the rights of way, and of the land for station buildings and depot grounds, as drawn and laid down on map, be, and the the same are hereby, adopted as and for the location of this company's railroad between the points above specified, and as and for the right of way and grounds for station buildings and depot grounds, to be conveyed to this company under and pursuant to an agreement made and entered into between F. R. Delano, agent of this company and of the Northern Pacific Railroad Company, and the Devil's Lake Indians, of said reservation, on or or about July 28, 1883.

"On motion of Mr. Fry, seconded by Mr. Tyndale, the following resolution was adopted:

"Whereas a survey of the line of the railroad of this company through the reservation of the Devil's Lake Indians has been made and a map has been prepared by the chief engineer and adopted by resolutions of this board this day, showing the definite location of said line, the boundaries of the right of way and of the lands for station buildings and depot grounds within said reservation; and

"Whereas it appears that the lands comprised within said boundaries in all amount to 184.5 acres:

"*Resolved*, That the president of this company be, and he is hereby, authorized to take such measures as shall be proper to provide funds amounting to $10 per acre of said lands, viz, $1,845, and in behalf of this company to pay the same into the Department of the Interior or to the agent of the Indians, or otherwise to dispose of said sum for the benefit of said Indians, as shall be deemed advisable by said Department of Interior, in pursuance of the agreement made with said Indians on or about July 28, 1883."

In witness whereof I, Sidney Starbuck, the secretary of said Jamestown and Northern Railroad Company, duly authorized thereto by the board of directors of said company, have hereunto set my hand and the official seal of said company the day and year first above written.

[SEAL.]

SIDNEY STARBUCK,
Secretary of the Jamestown and Northern Railroad Company.

No. 4.

UNITED STATES INDIAN SERVICE,
Devil's Lake Agency, January 9, 1884.

SIR: Acknowledging receipt of office letter of December 15, L, 22351, inclosing tracing showing location of ground selected for a station, &c., by the Jamestown Northern Railroad Company to be placed upon the Indian reservation, I have the honor to state that I approve the location as described. This was the point agreed upon, but upon mutual arrangement it can be changed half a mile or a mile in either direction on the line of the road so as to secure a level place for side-tracks without grade and easily accessible to teams.

I am sir, very respectfully, your obedient servant,

JOHN W. CRAMSIE,
U. S. Indian Agent.

Hon. H. PRICE,
Commissioner of Indian Affairs, Washington, D. C.

No. 5.

LAW OFFICES OF HOLMES & ADAMS,
35 *Wall Street, New York, March* 1, 1884.

DEAR SIR: Referring to the question of the right of way for the Jamestown and Northern Railroad Company through the Devil's Lake Indian Reservation in Dakota, mentioned in your communication L, 14815, of date September 29, 1883, and also referring to my letter to you of December 8, 1883, I beg to call your attention to the request in the last-mentioned letter to be informed what further deeds, if any, or agree-

ments will be required by the Department between this company and said Indians and as to the manner in which the consideration money, viz, $1,845, should be paid.

The Jamestown and Northern Railroad Company is very desirous of settling up this matter, and have appropriated and set apart said sum of money and await the instructions of the Department as to when and in what manner the money shall be paid. I have been informed that heretofore it has been the custom to pay into your Department the money due to Indians for right of way through the reservation.

Will you accommodate me with an early reply, and oblige,

Yours, very truly,

GEORGE H. ADAMS,
President Jamestown and Northern Railroad Company.

E. L. STEVENS, Esq.,
Acting Commissioner of the Interior, Washington, D. C.

A BILL granting a right of way to the Jamestown and Northern Railroad Company through the Devil's Lake Indian Reservation in the Territory of Dakota.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That a right of way through the Devil's Lake Indian Reservation in the Territory of Dakota, not exceeding two hundred feet in width, with grounds for station and depot purposes, according to the map and plat thereof respectively now on file in the office of the Secretary of the Interior, be, and is hereby, granted to the Jamestown and Northern Railroad Company, a corporation duly organized under the laws of the Territory of Dakota, upon the terms and conditions mentioned and set forth in a certain proposition in writing, dated July twenty-eighth, eighteen hundred and eighty-three, made and submitted to the United States Indian agent at Devil's Lake Agency by F. R. Delano on behalf of the Northern Pacific Railroad Company, as the same is modified by a memorandum of consent in writing thereto appended, signed by a majority of the chiefs and headmen of the Indians occupying the Devil's Lake Reservation, now on file in the office of the Secretary of the Interior, which said terms and conditions, so modified, have been accepted by the said Jamestown and Northern Railroad Company by a resolution of the board of directors of said company adopted October fifth, eighteen hundred and eighty-three, a certified copy whereof is also on file in the said office: *Provided*, That the amount of compensation thereby agreed to be paid to said Indians shall be deposited by the said Jamestown and Northern Railroad Company in the Treasury of the United States to the credit of the Sisseton, Wahpeton, and Cut-head Sioux Indians occupying the Devil's Lake Reservation within sixty days after the passage of this act, to be expended for the benefit of said Indians in such manner as the Secretary of the Interior may direct; *Provided further*, That whenever said right of way and station and depot grounds shall cease to be used for railroad purposes, the same shall revert to the United States, and that the right to repeal, alter, or amend this act is reserved to Congress.

O

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 32.

POSTAL SERVICE.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

Estimates from the Postmaster-General of $100,000 *for railway post-office car service, and* $75,000 *for pay of clerks in post-offices, to supply deficiency in the appropriation for the current fiscal year.*

DECEMBER 15, 1884.—Referred to the Committee on Appropriations and ordered to be printed.

TREASURY DEPARTMENT,
December 13, 1884.

SIR: I have the honor to forward herewith, for the consideration of Congress, estimates received from the Postmaster-General to supply deficiencies in appropriations for the postal service for the current fiscal year, payable out of the postal revenues, as follows:

For railway post-office car service, $100,000.

For compensation to clerks in post-offices, $75,000.

Very respectfully,

H. McCULLOCH,
Secretary.

Hon. JOHN G. CARLISLE,
Speaker, House of Representatives.

POST-OFFICE DEPARTMENT,
OFFICE OF THE POSTMASTER-GENERAL,
Washington, D. C., December 11, 1884.

SIR: I have the honor to inclose herewith estimates for a deficiency appropriation of $100,000 for the postal-car service, and of $75,000 for the salaries of clerks in post-offices, during the remainder of the current fiscal year.

I will thank you to transmit these estimates to Congress in accordance with section 2, act of July 7, 1884, p. 254, vol. 23, U. S. Statutes at Large.

Very respectfully,

JNO. SCHUYLER CROSBY,
Acting Postmaster-General.

Hon. HUGH MCCULLOCH,
Secretary of the Treasury.

POST-OFFICE DEPARTMENT,
OFFICE OF THE POSTMASTER-GENERAL,
Washington, D. C., December 5, 1884.

SIR: I have the honor to state that the accomplishment of certain long-desired improvements in the postal service, whereby the time in transit between the East and the far West has been reduced, rendered it necessary to establish a greater amount of railway post-office car service than was anticipated when the estimate was submitted and the appropriation was made for that object for the current fiscal year.

In order to maintain this improved service and provide for such additional service as may become necessary during the remainder of the year, the additional sum of $100,000 is required.

I therefore recommend that the same be at once appropriated for the service for the current fiscal year.

Very respectfully,

FRANK HATTON,
Postmaster-General.

Hon. J. G. CARLISLE,
Speaker, House of Representatives.

POST-OFFICE DEPARTMENT,
OFFICE OF THE FIRST ASSISTANT POSTMASTER-GENERAL,
SALARY AND ALLOWANCE DIVISION,
Washington, D. C., December 4, 1884.

SIR: I have the honor to call your attention to the urgent need of an additional appropriation for clerks in post-offices for the current fiscal year.

The available fund for clerks in post-offices at the disposal of this office, at this date, is $4,379.69. This amount, it is almost unnecessary to say, will not be sufficient to meet the ordinary calls for allowances for clerks for the remainder of this fiscal year, not to mention emergencies, requiring prompt action and relief, which may arise at any moment.

The appropriation for the present year is $4,900,000, an increase of $125,000, or 2.6 per cent. over the appropriation for the previous year. The appropriation for that year was $4,775,000, being an increase of $390,000, or 8.8 per cent., as compared with the fiscal year 1882–'83.

At the beginning of the present fiscal year—July 1, last—the aggregate allowances for clerks in post-offices, as shown by the records of this office, amounted to $4,883,655. This sum deducted from the appropriation for clerks in post-offices left a surplus fund of only $16,335. At that time it was anticipated that reductions in the allowances for

clerks in the larger post-offices could be made, and thus create a fund sufficient to meet all demands for clerk-hire for the present year.

Commissioners were appointed by the Postmaster-General to visit the larger post-offices, to examine into and report upon the clerical needs of the several offices.

The commissioners visited and reported upon the post-offices in the cities of Baltimore, Boston, Brooklyn, Buffalo, Chicago, Cincinnati, Cleveland, Indianapolis, Louisville, New Orleans, New York, Philadelphia, Pittsburgh, Saint Louis, and San Francisco, Cal., fifteen in number, and, with the exception of New Orleans and Pittsburgh, where small reductions were recommended, increased allowances for clerk-hire were recommended.

To provide for the increased allowances for clerks so recommended, as approved by the Postmaster-General, and to meet other and urgent demands, and at the same time keep the expenditures for clerks in post-offices within the appropriation as fixed by Congress, it was necessary to make reductions of the allowances for clerk-hire wherever the same could be made without embarrassing the postal service.

A careful examination of the requirements of all the offices resulted in 653 reductions of allowances, to take effect from September 1, 1884. Although this action was unavoidable, it was an apparent injustice to many postmasters whose allowances were already too small.

At the present time 782 applications for allowances for clerk-hire from postmasters are on the files of this office, held up on account of the exhausted state of the appropriation for clerks in post-offices.

Most of these applications are meritorious, and many of them would have been favorably considered as soon as received if the appropriation applicable for the purpose had been ample to meet the additional expenditure required.

In addition to the foregoing statements, I desire to call attention to the wonderful increase and rapid growth of the postal service. This is shown by the fact that the Department was compelled to grant 3,917 allowances for clerk-hire during the past year, an increase of 1,159, or 42.01 per cent., as compared with the year 1883, and 2,581, or 193.2 per cent., over the year 1882. The large increase of letter mail occasioned by the reduction of postage from 3 to 2 cents, from October 1, 1883, has made additional clerical assistance absolutely necessary in almost every office of the first, second, and third classes.

In view of these facts, I have the honor to recommend that an additional appropriation of $75,000 for clerks in post-offices for the present fiscal year be asked for, with the request that the appropriation be made available from the passage of the act authorizing the same.

Very respectfully,

JNO. SCHUYLER CROSBY,
First Assistant Postmaster-General.

Hon. FRANK HATTON,
Postmaster-General, Washington, D. C.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 33.

CONTINGENT FUND OF THE DEPARTMENT OF STATE.

LETTER

FROM

THE SECRETARY OF STATE,

TRANSMITTING

Statements of expenditure of the contingent fund of the Department of State for the year ending June 30, 1884.

DECEMBER 15, 1884.—Referred to the Committee on Expenditures in the Department of State and ordered to be printed.

DEPARTMENT OF STATE,
Washington, December 12, 1884.

The Secretary of State, in pursuance of the requirements of sections 193 and 209 of the Revised Statutes, has the honor to submit to Congress the following statements, viz:

A.—Giving a detailed statement of the manner in which the contingent fund for the Department of State for the year ending June 30, 1884, has been expended;

B.—A statement of the expenditures from the contingent fund for the expenses of foreign intercourse, including the contingent fund for the expenses of all the missions abroad, for the year ending June 30, 1884, with the balances of all former appropriations in each case on hand in the Treasury Department and in the hands of the disbursing clerk of the Department of State; and

C.—Being a precise analytical statement of all moneys disbursed by the disbursing clerk of this Department during the fiscal year ended June 30, 1884.

FREDK. T. FRELINGHUYSEN.

Hon. JOHN G. CARLISLE,
Speaker of the House of Representatives.

A.—*Contingent expenses Department of State*, 1884.

To whom paid.	On what account.	Amount.
Washington Gas Light Company	Gas	$38 55
Great Falls Ice Company	Ice	371 80
Unionist-Gazette Association	Subscription	2 00
Chesapeake and Potomac Telephone Company.	Rent of telephone	305 34
Louisville and Nashville Railroad Company.	Freight	15 90
Evening Journal Association, Jersey City.	Subscription	6 00
New York Evening Post	do	9 00
Baltimore Sun	do	13 20
Washington Post	do	6 00
F. Schneider & Son	Screws, pincers, tacks, rosin, tin, &c	54 12
Houghton, Mifflin & Co	Subscription to Postal Guides	4 20
New York Commercial Advertiser	Subscription	9 00
W. H. Boyd	District Directory (2 copies)	10 00
Boston Daily Advertiser	Subscription	12 00
J. W. Boteler & Son	Flower-pots, gallon oil	1 00
Keyes & Co	Carriage hire	7 50
Joseph J. Walton	Safety matches	10 70
William Wanstall & Bro	Carriage hire	1 50
District Messenger Company	Service	45
C. Schneider	Repairing safe-locks	18 50
Gottlieb Spitzer	Patent stamp	15 00
Abram Jones	Staining shelving	2 00
Newark Daily Advertiser	Subscription	5 67
Adams Express Company	Expressage	8 00
McFarland & Stephenson	Cartage	3 00
H. J. Hart	Insect powder	10 00
Evening Star Newspaper Company	Subscription	24 00
Murray & Barker	Horse-shoeing	28 25
B. Koch	Repairing harness	58 25
O. H. P. Clark	Pasturing horse 1 month and 23 days	14 06
John McDermott & Bros	Repairing carriage and wagon	143 75
John W. Drew	Soap, sponge, oil, horse medicine	5 20
W. M. Galt & Co	Horse feed	212 26
R. A. Dore	Shoeing horses	106 75
J. J. Shipman	Hay	18 92
Conrad Becker	Horse-covers, &c	28 50
Henry C. Stroman	Straw for stable	11 22
A. Saks & Co	Covering material (care of horses)	25 00
R. H. Perry	Hay	21 25
E. B. Lafferty	do	21 22
Charles B. Cockrell	Straw for stable	15 56
S. Queen	Hay	18 12
E. W. Bullinger	Subscription to Monitor Guide	6 00
George Ryneal, jr	Paints, oils, glass, &c	89 [illegible]
William F. Lutz	Stamps, ribbons, and repairs	48 60
E. K. Lundy	Newspapers	70 80
Elizabeth H. Brown	Washing towels	120 00
William H. Dice	Repairing furniture, materials, &c	147 25
William Callow	Newspapers	329 00
Washington and Georgetown Railroad Company.	Car tickets	120 00
Lansburgh & Bro	Alpaca for draping Department	43 44
George W. Knox	Cartage and freight	25 14
Diamond Match Company	Matches	19 50
Baltimore and Ohio Express Company.	Express charges	8 15
Timothy Costello	Rent of stable and shed	600 00
Royce & Marean	Wire, zinc, binding posts, &c	16 08
D. Marean	Telegraph apparatus	80 00
Royce & Marean	Electric bells and wires in bureaus of Department	341 62
William W. Farr	Winding and repairing clocks	150 00
E. Howard Watch and Clock Company.	Record dials	1 25
Chemical Vaporizer Company	1 volatilizer	15 00
Total		3,923 86

B.—*Contingent expenses foreign missions*, 1884, *paid by disbursing clerk of the Department of State.*

To whom paid.	On what account.	Amount.
New York Herald	Subscription	$201 89
New York Times	do	148 24
Boston Daily Advertiser	do	18 20
Cincinnati Commercial Gazette	do	18 13
Saint Louis Globe Democrat	do	7 16
Newark Daily Advertiser	do	12 10
Portland (Me.) Publishing Company	do	10 13
New York Tribune Association	do	198 51
S. L. Hempstone	Cotton for mail bags	9 00
B. Koch	Repairing mail bags	152 35
Diplomatic service	Traveling expenses	265 93
Adams Express Company	Expressage	25 75
Indianapolis Journal	Subscription	15 64
Mary Gaynor	Making mail pouches	19 35
James J. Chapman	Stationery	6,976 77
V. G. Fischer	do	401 75
National Republican	Subscription	5 00
Western Union Telegraph Company	Telegrams	10,799 20
Washington City post-office	Postage and stamps	359 62
Haughwout Howe	Freights, telegrams, and salary	1,388 31
Diplomatic service	Traveling expenses	139 25
Baltimore and Ohio Telegraph Company.	Telegrams	434 66
Chicago Tribune Company	Subscription	15 26
George F. Wassmann	Castings and copper wire	40 00
William F. Lutz	Stamps	8 00
T. B. Peddie & Co	Locks and keys	52 50
John W. Foster	Expenses in going to and returning from La Granja, Spain.	155 00
George W. Thompson	Copy of record of naturalization of Patrick O'Donnell.	1 00
San Francisco Bulletin Company	Subscription	14 55
F. G. Haughwout	Expenses under special instructions from Department of State.	22 74
W. H. Morrison	Copy of tariff	1 50
S. L. Phelps	Clerk hire	38 40
Walter H. McDaniels	Flags	495 00
C. A. Logan	Clerk hire	250 00
T. Canisius	Expenses of prisoner in jail at Apia	72 00
Washington Post	Subscription	6 00
A. G. Gedney	Lithographing and engraving	73 55
Eugene Schuyler	Office furniture for legation	82 02
Houghton, Mifflin & Company	Postal guides	6 30
William H. Morrison	Books for legation	36 00
Evening Star Newspaper Company	Subscription	24 00
		23,000 76

B 1.—*Statement of contingent expenses of all missions abroad from July* 1, 1883, *to June* 30, 1884. (*Extract from Fifth Auditor's Report of November* 8, 1884.)

[*a* comprises all accounts received.]

Country.	Officers.	Salaries adjusted.	Contingent expenses and loss by exchange.	Total.	Passport fees.
Argentine Republic.	T. O. Osborn, minister	$7,500 00	$413 50	$7,913 50	$10 00
Austria	A. Taft, minister	12,000 00	1,008 89		255 00
	H. White, late secretary of legation	723 88			
	W. T. Strong, secretary of legation	*a*136 96		13,869 73	
Belgium	N. Fish, minister	7,500 00	450 00	7,950 00	45 00
Bolivia	Richard Gibbs, minister and consul-general.	4,809 79	384 61		
	George Maney, late minister and consul-general.	1,154 90		6,349 30	
Brazil	T. A. Osborn, minister	12,000 00	726 82		10 00
	C. B. Trail, chargé d'affaires *ad interim*	1,368 13			
	C. B. Trail, secretary of legation	900 43			
	John C. White, late secretary of legation	225 00		15,220 38	

B 1.—*Statement of contingent expenses of all missions abroad, &c.*—Continued.

Country.	Officers.	Salaries adjusted.	Contingent expenses and loss by exchange.	Total.	Passport fees.
Central American States.	H. C. Hall, minister	$10,000 00	$2,580 40	$12,580 40	
Chili	C. A. Logan, minister	9,230 78	881 37	10,112 15	
China	J. R. Young, minister	12,000 00	3,863 57		$125 00
	C. Holcombe, secretary of legation and interpreter.	5,000 09	1,167 67	22,031 24	
Colombia	W. L. Scruggs, minister	a5,625 00	306 00	5,931 00	
Denmark	W. Hoffmann, minister and consul-general.	5,000 00	808 32	5,808 32	30 00
France	L. P. Morton, minister	17,500 00	3,251 95		526 31
	E. J. Brulatour, chargé d'affaires *ad interim*.	2,316 06	1 66		
	E. J. Brulatour, secretary of legation	1,627 35	7 26		
	H. Vignaud, second secretary of legation	2,000 00	7 37	26,711 65	
Germany	A. A. Sargent, minister	17,500 00	1,263 52		880 00
	H. S. Everett, chargé d'affaires *ad interim*	2,968 74	1,200 00		590 00
	H. S. Everett, secretary of legation	1,734 23	6 93		
	C. Coleman, second secretary of legation	2,000 00	11 50	26,684 92	
Great Britain	J. R. Lowell, minister	17,500 00	3,655 08		327 02
	W. J. Hoppin, chargé d'affaires *ad interim*.	1,426 64	706 39		143 07
	E. S. Nadal, late secretary of legation	1,000 00			
	W. J. Hoppin, secretary of legation	2,196 94			
	H. White, second secretary of legation	1,195 67		27,674 72	
Hawaiian Islands.	R. M. Daggett, minister	7,500 00	313 66	7,813 66	
Hayti	J. M. Langston, minister and consul-general.	a2,500 00	324 62	2,824 62	5 00
Italy	W. W. Astor, minister	12,000 00	504 26		120 00
	L. Richmond, chargé d'affaires *ad interim*.	978 26	48 91	13,531 43	
Japan	J. A. Bingham, minister	12,000 00	524 94		15 00
	G. Goward, secretary of legation	2,500 00			
	W. N. Whitney, interpreter	2,500 00		17,524 94	
Liberia	J. H. Smythe, minister and consul-general.	a3,750 00	428 44	4,178 44	
Mexico	P. H. Morgan, minister	12,000 00	2,435 40		170 00
	H. H. Morgan, secretary of legation	1,800 00		16,235 40	
Netherlands	W. L. Dayton, minister	7,500 00	442 50		15 00
Paraguay and Uruguay.	W. Williams, chargé d'affaires	5,000 00	371 48	7,942 50 5,371 48	10 00
Persia	S. G. W. Benjamin, minister and consul-general.	a3,750 00	3,143 44	6,893 44	
Peru	S. L. Phelps, minister	9,619 56	4,613 71	14,233 27	
Portugal	J. M. Francis, minister and consul-general.	5,000 00	1,513 66	6,513 66	10 00
Roumania, Servia, and Greece.	E. Schuyler minister and consul-general	6,500 00	1,068 02	7,568 02	126 00
Russia	W. H. Hunt, late minister	11,538 46	3,946 78		85 00
	G. W. Wurts, chargé d'affaires *ad interim*.	3,712 11	1,152 13		25 00
	G. W. Wurts, secretary of legation	1,511 31		21,860 79	
Siam	J. A. Halderman, minister and consul-general.	5,000 00	965 95	5,965 95	
Spain	J. W. Foster, minister	12,000 00	5,504 59		15 00
	D. T. Reed, chargé d'affaires *ad interim*	1,387 62	48 47		
	J. W. Foster, for clerk to legation	1,367 10		20,304 78	
Sweden and Norway.	W. W. Thomas, jr., minister	7,112 77	804 36	7,917 13	5 00
Switzerland	M. J. Cramer, minister and consul-general	5,000 00	1,291 28	6,291 28	270 00
Turkey	L. Wallace, minister	7,500 00	2,398 13		45 00
	G. H. Heap, chargé d'affaires *ad interim*	1,136 59	813 09		10 00
	A. A. Garguilo, interpreter	3,000 00	12 68	14,860 49	
Venezuela	Jehu Baker, minister	7,500 00	219 23	7,719 23	

B 1.—*Statement of contingent expenses of all missions abroad, &c.*—Continued.

Country.	Officers.	Salaries adjusted.	Contingent expenses and loss by exchange.	Total.	Passport fees.
OTHER PLACES.					
Apia	Theodore Canisius, consul		$72 00	$72 00	
Barcelona	F. H. Scheuch, consul		100 00	100 00	
Cairo	G. P. Pomeroy, consul-general		250 00		
	N. D. Comanos, vice-consul-general		125 00		
				375 00	
Corea	L. H. Foote, diplomatic agent		1,491 65	1,491 65	
Havre	J. B. Glover, consul		81 91	81 91	
Leghorn	Charles P. Barnard, consul		27 02	27 02	
Liverpool	S. B. Packard, dispatch agent		729 99	729 99	
London	B. F. Stevens, dispatch agent		5,438 68	5,438 68	
Sonsonat e	J. Mathe, consul		145 37	145 37	
State Department.	R. C. Morgan, late disbursing clerk		9,581 58		
	F. J. Kieckhoefer, disbursing clerk		13,419 18		
				23,000 76	
Windsor	Charles Ewers, consul		100 00	100 00	
Zanzibar	F. M. Cheney, consul		60 00	60 00	
		$328,801 28	87,208 92	416,010 20	$3,872 40

RECAPITULATION.

Paid for salaries of ministers and chargés d'affaires	$282 091 26
Paid for salaries of chargés d'affaires *ad interim*	15,291 15
Paid for salaries of secretaries of legation, interpreters, and legation clerks	31,418 87
Paid for contingent expenses foreign missions	85,010 04
Paid for loss by exchange	2,198 88
	416,010 20

B 2.—*Statement of amount of all former appropriations for contingent expenses of the Department of State and contingent expenses of foreign intercourse, including all missions abroad, on hand June* 30, 1884.

In the Treasury:	
Contingent fund, Department of State, 1883	$32 00
Contingent fund, foreign intercourse, 1882	9,590 76
Contingent fund, foreign intercourse, 1883	5,264 80
Contingent fund, foreign intercourse, 1884	9,705 60
In hands of disbursing clerk:	
Contingent fund, Department of State, 1884	876 14
Contingent fund, foreign intercourse, 1884	2,543 57
Total	28,012 87

C.—*Analytical statement of all moneys disbursed by the disbursing clerk of the Department of State during the fiscal year ending June* 30, 1884.

International commission for the establishment of electrical units	$4,899 09
Monument to Thomas Jefferson at Monticello	182 94
Monument to mark the birthplace of George Washington	3,616 82
International Fishery Exhibition of 1883 at London	5,472 52
Purchase of the Franklin collection of books and papers	86 89
Publication of information in aid of societies of the Red Cross	882 76
Salary and burial expenses of and erecting a stone to George P. Marsh, late minister to Italy	1,219 12
Transporting remains of ministers and consuls to their homes for interment	251 65
Expenses of the Siamese embassy	2,225 32
Contingent expenses United States consulates, 1882	100 72
Contingent expenses United States consulates, 1883	19,530 04
Contingent expenses United States consulates, 1885	29,160 18
Contingent expenses, foreign missions, 1882	320 17
Contingent expenses, foreign missions, 1883	3,470 37

Contingent expenses, foreign missions, 1884	$23,000 76
Books and maps, Department of State, 1882	541 48
Books and maps, Department of State, 1884	2,944 76
Editing, publishing, and distributing Revised and Annual Statutes, 1883.	17 66
Editing, publishing, and distributing Revised and Annual Statutes, 1884.	4,251 58
Stationery, furniture, &c., Department of State, 1883	653 50
Stationery, furniture, &c., Department of State, 1884	4,358 19
Publication of consular and other commercial reports, Department of State, 1883	634 81
Publication of consular and other commercial reports, Department of State, 1884	18,924 76
Rescuing shipwrecked American seamen, 1883	519 08
Rescuing shipwrecked American seamen, 1884	1,488 66
Expenses under the neutrality act, 1883	1,297 44
Expenses under the neutrality act, 1884	7,903 43
Bringing home criminals, 1883	575 12
Removal and rearrangement of records, Department of State, 1883 and 1884	366 80
Contingent expenses, Department of State, 1884	3,923 86
Proof-reading, Department of State, 1884	1,010 00
Lithographing, Department of State, 1884	997 10
Salaries, Department of State, 1884	95,826 14
Total	240,653 72

F. J. KIECKHOEFER,
Disbursing Clerk.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 34.

TREASURY DEPARTMENT, Document No. 663. Secretary—W. E. & A.

COST OF COLLECTING REVENUE AT PORTS OF ENTRY FOR FISCAL YEAR ENDING JUNE 30, 1886.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

Estimates of the cost of collecting the revenue at each port of entry of the United States for the fiscal year ending June 30, 1886.

DECEMBER 15, 1884.—Referred to the Committee on Appropriations and ordered to be printed.

TREASURY DEPARTMENT, *December* 12, 1884.

SIR: In compliance with the provisions of section 5 of the act approved August 5, 1882, entitled "An act making appropriations for the legislative, executive, and judicial expenses of the Government for the fiscal year ending June 30, 1883," I have the honor to transmit herewith an estimate specifying in detail the number and class of officers and employés of every grade and nature, with the rates of compensation which will be necessary to properly conduct the business of collecting the revenue at each port of entry in the United States for the fiscal year ending June 30, 1886, together with an estimate of the amount required for contingent expenses at each of said ports, and for such additional expenses of the service as cannot be otherwise specifically provided for.

These estimates are made to cover the expenditures required for the customs service as at present organized. If, however, the views expressed by the late Secretary Folger are concurred in as to the need of a consolidation of customs districts, thus dispensing with machinery for collecting the revenue in districts where no revenue is collected, and in other districts where the duties collected do not cover the expense of maintaining the service, the cost of the service could be reduced without impairing its efficiency.

Very respectfully,

H. McCULLOCH,
Secretary.

Hon. JOHN G. CARLISLE,
Speaker of the House of Representatives.

Estimate of expenses of collecting the revenue from customs for the fiscal year ending June 30, 1886, showing the number of employés and their salaries in each collection district.

MAINE.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Houlton, district of Aroostook.			
1	Collector	.....	$1,500	$1,500 00
1	Deputy collector	$4 00	.....	1,460 00
5	Deputy collectors and inspectors, each	3 00	.....	5,475 00
1	Inspector	2 00	.....	730 00
8	Total	.....	.....	9,165 00
	Port of Bangor, district of Bangor.			
1	Collector	.....	2,000	2,000 00
1	Deputy collector and inspector	.....	1,600	1,600 00
1	.....do	4 00	.....	1,460 00
7	Deputy collectors and inspectors, each	3 00	.....	7,665 00
1	Night watchman	2 00	.....	730 00
11	Total	.....	.....	13,455 00
	Port of Bath, district of Bath.			
1	Collector	.....	2,000	2,000 00
1	Deputy collector and inspector	.....	1,600	1,600 00
3	Deputy collectors and inspectors, each	3 00	.....	3,285 00
1	Deputy collector and inspector	2 20	.....	803 00
1	.....do	95	.....	346 75
1	.....do	70	.....	255 50
8	Total	.....	.....	8,290 25
	Port of Belfast, district of Belfast.			
1	Collector	.....	1,200	1,200 00
2	Deputy collectors and inspectors, each	3 00	.....	2,190 00
1	Deputy collector and inspector	55	.....	200 75
1	.....do	80	.....	292 00
1	.....do	30	.....	109 50
6	Total	.....	.....	3,992 25
	Port of Castine, district of Castine.			
1	Collector	.....	1,200	1,200 00
1	Deputy collector and inspector	3 00	.....	1,095 00
3	Deputy collectors and inspectors, each	.....	600	1,800 00
1	Deputy collector and inspector	.....	365	365 00
6	Total	.....	.....	4,460 00
	Port of Ellsworth, district of Frenchman's Bay.			
1	Collector	.....	1,200	1,200 00
1	Deputy collector and inspector	3 00	.....	1,095 00
1	.....do	.....	800	800 00
2	Deputy collectors and inspectors, each	1 65	.....	1,204 50
1	Deputy collector and inspector	05	.....	18 25
6	Total	.....	.....	4,317 75
	Port of Kennebunk, district of Kennebunk.			
1	Collector	.....	100	100 00
1	Deputy collector and inspector	1 60	.....	584 00
2	Total	.....	.....	684 00
	Port of Machias, district of Machias.			
1	Collector	.....	1,200	1,200 00
1	Deputy collector and inspector	3 00	.....	1,095 00
2	Deputy collectors and inspectors, each	.....	300	600 00
4	Total	.....	.....	2,895 00

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

MAINE—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Eastport, district of Passamaquoddy.			
1	Collector	.....	$3,000	$3,000 00
1	Deputy collector and inspector	.....	1,800	1,800 00
1	.....do	$4 00	.....	1,460 00
6	Deputy collectors and inspectors, each	3 00	.....	6,570 00
4	.....do	2 50	.....	3,650 00
3	.....do	2 00	.....	2,190 00
4	Watchmen, each	2 00	.....	2,920 00
20	Total	.....	.....	21,590 00
	Port of Portland, district of Portland and Falmouth.			
1	Collector	.....	5,000	5,000 00
2	Deputy collectors, each	.....	2,500	5,000 00
2	.....do	.....	1,800	3,600 00
1	Clerk	.....	1,500	1,500 00
20	Inspectors, each	3 50	.....	25,550 00
1	Deputy collector	.....	1,000	1,000 00
1	Marker	.....	730	730 00
1	Laborer	.....	720	720 00
2	Boatmen, each	2 00	.....	1,460 00
4	Clerks, each	.....	1,200	4,800 00
2	.....do	.....	1,100	2,200 00
1	Clerk	.....	1,000	1,000 00
1	Messenger	.....	650	650 00
1	Watchman	.....	730	730 00
11	Inspectors (for 6 months), each	3 50	.....	14,052 50
4	Watchmen (for 6 months), each	2 00	.....	2,920 00
55	Total	.....	.....	70,912 50
	Port of Saco, district of Saco.			
1	Collector	.....	300	300 00
1	Deputy collector	.....	450	450 00
2	Total	.....	.....	750 00
	Port of Waldoborough, district of Waldoborough.			
1	Collector	.....	1,500	1,500 00
2	Deputy collectors and inspectors, each	4 00	.....	2,920 00
1	Deputy collector and inspector	3 00	.....	1,095 00
1	.....do	2 50	.....	912 50
2	.....do	2 00	.....	1,460 00
7	Total	.....	.....	7,887 50
	Port of Wiscasset, district of Wiscasset.			
1	Collector	.....	1,200	1,200 00
1	Deputy collector and inspector	3 00	.....	1,095 00
1	.....do	3 00	.....	1,095 00
1	.....do	2 00	.....	730 00
4	Total	.....	.....	4,120 00
	Port of York, district of York.			
1	Collector	.....	250	250 00
1	Total	.....	.....	250 00

NEW HAMPSHIRE.

	Port of Portsmouth, district of Portsmouth.			
1	Collector	.....	$2,000	$2,000 00
1	Inspector	$4 00	.....	1,460 00
4	Deputy collectors and inspectors, each	3 50	.....	5,110 00
1	Deputy collector and inspector	3 00	.....	1,095 00
1	.....do	.....	600	600 00
1	Boatman	.....	400	400 00
9	Total	.....	.....	10,665 00

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

VERMONT.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Burlington, district of Vermont.			
1	Collector	.....	.....	$5,000 00
1	Deputy collector	.....	.....	2,500 00
2	Deputy collectors and inspectors, each	.....	$1,800	3,600 00
4	.....do	.....	1,600	6,400 00
1	Deputy collector and inspector	.....	.....	1,400 00
4	Deputy collectors and inspectors, each	.....	1,200	4,800 00
3	.....do	.....	1,400	4,200 00
11	.....do	.....	1,000	11,000 00
2	Inspectors, each	.....	1,400	2,800 00
21	.....do	.....	1,000	21,000 00
6	Deputy collectors and inspectors, each	.....	600	3,600 00
2	Night watchmen, each	.....	600	1,200 00
1	Clerk	.....	.....	600 00
2	Deputy collectors and inspectors, each	.....	1,000	2,000 00
1	Deputy collector and inspector	.....	.....	800 00
1	Clerk	.....	.....	1,000 00
1	Boatman	.....	.....	600 00
4	Tally clerks	.....	240	960 00
68	Total	.....	.....	73,460 00

MASSACHUSETTS.

	Port of Barnstable, district of Barnstable.			
1	Collector	.....	$1,500	$1,500 00
1	Deputy collector and inspector	.....	1,095	1,095 00
1	.....do	$2 50	.....	912 50
1	.....do	2 00	.....	730 00
2	Deputy collectors and inspectors, each	2 00	.....	1,460 00
2	.....do	.....	400	800 00
1	Deputy collector and inspector	.....	400	400 00
1	Clerk	.....	300	300 00
1	Boatman	.....	60	60 00
11	Total	.....	.....	7,257 50
	Port of Boston, district of Boston and Charlestown.			
	COLLECTOR'S OFFICE.			
1	Collector	.....	8,000	8,000 00
3	Deputy collectors, each	.....	3,000	9,000 00
1	Comptroller and principal clerk	.....	4,500	4,500 00
1	Auditor	.....	3,000	3,000 00
1	Cashier	.....	3,000	3,000 00
1	Assistant cashier	.....	2,200	2,200 00
1	Secretary and chief clerk	.....	2,500	2,500 00
4	Chief clerks, each	.....	2,000	8,000 00
8	Clerks, each	.....	1,800	14,400 00
19	.....do	.....	1,600	30,400 00
31	.....do	.....	1,400	43,400 00
15	.....do	.....	1,200	18,000 00
20	.....do	.....	1,000	20,000 00
1	.....do	.....	840	840 00
5	.....do	.....	800	4,000 00
1	Copyist	.....	600	600 00
8	Night watchmen, each	2 00	.....	5,840 00
5	Messengers	.....	840	4,200 00
8	.....do	.....	720	5,760 00
1	Carpenter	2 25	.....	821 25
2	Foremen of laborers, each	.....	1,000	2,000 00
34	Laborers, each	2 00	.....	24,820 00
1	Watchman	3 00	.....	1,095 00
1	Clerk in charge of public store	.....	2,000	2,000 00
1	Clerk and storekeeper	.....	2,000	2,000 00
87	Inspectors, each	4 00	.....	127,020 00
1	Female inspector	.....	300	300 00
1	Measurer of marble (when employed)	3 50	.....	1,277 50
25	Night inspectors	3 00	.....	27,375 00
3	Weighers, each	.....	2,000	6,000 00
3	Assistant weighers, each	4 00	.....	4,380 00
15	.....do	3 50	.....	19,162 50

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

MASSACHUSETTS—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Boston, district of Boston and Charlestown—Continued.			
	COLLECTOR'S OFFICE—Continued.			
13	Assistant weighers, each	$3 00	.....	$14,235 00
1	Gauger	.....	$2,000	2,000 00
2	Assistant gaugers, each	4 00	.....	2,920 00
3	Weighers' clerks, each	.....	1,000	3,000 00
4	Boatmen, each	2 25	.....	3,285 00
332	Total	.....	.....	431,331 25
	NAVAL OFFICE.			
1	Naval officer	.....	5,000	5,000 00
1	Deputy naval officer	.....	2,500	2,500 00
1	Chief clerk	.....	2,000	2,000 00
5	Clerks, each	.....	1,800	9,000 00
7	....do	.....	1,600	11,200 00
4	....do	.....	1,200	4,800 00
1	Messenger	.....	800	800 00
20	Total	.....	.....	35,300 00
	SURVEYOR'S OFFICE.			
1	Surveyor	.....	5,000	5,000 00
1	Deputy surveyor	.....	2,500	2,500 00
1	Chief clerk and assistant to surveyor	.....	2,000	2,000 00
1	Clerk	.....	1,600	1,600 00
2	Clerks, each	.....	1,400	2,800 00
2	....do	.....	1,200	2,400 00
1	Messenger	.....	840	840 00
1	....do	.....	720	720 00
10	Total	.....	.....	17,860 00
	APPRAISER'S OFFICE.			
1	General appraiser	.....	3,000	3,000 00
1	Appraiser	.....	4,000	4,000 00
1	Assistant appraiser and deputy	.....	3,000	3,000 00
2	Assistant appraisers, each	.....	2,500	5,000 00
1	Clerk to general appraiser	.....	1,400	1,400 00
1	Special examiner of drugs	.....	2,500	2,500 00
1	Examiner	.....	2,000	2,000 00
11	Examiners, each	.....	1,800	19,800 00
2	....do	.....	1,600	3,200 00
2	....do	.....	1,400	2,800 00
5	....do	.....	1,200	6,000 00
1	Clerk	.....	1,600	1,600 00
1	....do	.....	1,400	1,400 00
2	Clerks, each	.....	1,200	2,400 00
10	Samplers, each	.....	1,200	12,000 00
1	Assistant sampler	.....	840	840 00
11	Openers and packers, each	.....	900	9,900 00
4	Laborers, each	2 00	.....	2,920 00
2	Messengers, each	.....	840	1,680 00
60	Total	.....	.....	85,440 00
	Total port of Boston	.....	.....	569,931 25
	Port of Edgartown, district of Edgartown.			
1	Collector	.....	1,000	1,000 00
1	Deputy collector and inspector	.....	1,095	1,095 00
1	....do	2 00	.....	730 00
1	Boatman	.....	300	300 00
4	Total	.....	.....	3,125 00
	Port of Fall River, district of Fall River.			
1	Collector	.....	1,500	1,500 00
1	Deputy collector and inspector	4 00	.....	1,460 00
1	....do	3 00	.....	1,095 00
1	Clerk	.....	600	600 00
1	Boatman	.....	300	300 00
5	Total	.....	.....	4,955 00

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

MASSACHUSETTS—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Gloucester, district of Gloucester.			
1	Collector	.....	$2,000	$2,000 00
1	Deputy collector and inspector	.....	1,500	1,500 00
1	Clerk	.....	1,300	1,300 00
1	Inspector	$3 50	.....	1,277 50
4	Inspectors, each	3 00	.....	4,380 00
1	Inspector	80	.....	292 00
1	Boatman	.....	750	750 00
10	Total	.....	.....	11,499 50
	Port of Marblehead, district of Marblehead.			
1	Collector	.....	1,000	1,000 00
2	Deputy collectors and inspectors, each	3 00	.....	2,190 00
3	Total	.....	.....	3,190 00
	Port of Nantucket, district of Nantucket.			
1	Collector	.....	1,000	1,000 00
1	Deputy collector	.....	300	300 00
2	Total	.....	.....	1,300 00
	Port of New Bedford, district of New Bedford.			
1	Collector	.....	2,000	2,000 00
1	Deputy collector and inspector	.....	1,600	1,600 00
2	Inspectors, each	3 00	.....	2,190 00
1	Clerk	.....	1,000	1,000 00
5	Total	.....	.....	6,790 00
	Port of Newburyport, district of Newburyport.			
1	Collector	.....	1,200	1,200 00
1	Deputy collector and inspector	3 00	.....	1,095 00
2	Deputy collectors and inspectors, each	1 65	.....	1,204 50
4	Total	.....	.....	3,499 50
	Port of Plymouth, district of Plymouth.			
1	Collector	.....	1,200	1,200 00
1	Deputy collector	.....	1,000	1,000 00
2	Deputy collectors and inspectors, each	.....	200	400 00
4	Total	.....	.....	2,600 00
	Port of Salem, district of Salem and Beverly.			
1	Collector	.....	1,500	1,500 00
1	Deputy collector and inspector	4 00	.....	1,460 00
2	Inspectors, each	3 00	.....	2,190 00
3	.....do	2 60	.....	2,847 00
7	Total	.....	.....	7,997 00

RHODE ISLAND.

	Port of Bristol, district of Bristol and Warren.			
1	Collector	.....	$1,000	$1,600 00
1	Deputy collector and inspector	.....	600	600 00
2	Total	.....	.....	1,600 00

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

RHODE ISLAND—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Newport, district of Newport.			
1	Collector	.....	$1,000	$1,000 00
1	Deputy collector and clerk	.....	1,000	1,000 00
1	Inspector	$3 00	.....	1,095 00
1	.....do	1 65	.....	602 25
1	.....do	80	.....	292 00
5	Total	.....	.....	3,989 25
	Port of Providence, district of Providence.			
1	Collector	.....	4,000	4,000 00
1	Deputy collector	.....	2,000	2,000 00
1	Deputy collector and clerk	.....	1,800	1,800 00
4	Inspectors, each	3 50	.....	5,110 00
1	Inspector	3 00	.....	1,095 00
1	Messenger and storekeeper	3 00	.....	1,095 00
1	Inspector	1 65	.....	602 25
1	Examiner	.....	1,800	1,800 00
1	Clerk, messenger, and sampler	.....	1,200	1,200 00
1	Boatman	.....	600	600 00
1	Watchman ($1 additional for each Sunday and holidays)	1 50	.....	604 50
14	Total	.....	.....	19,906 75

CONNECTICUT.

	Port of Bridgeport, district of Fairfield.			
1	Collector	.....	$1,200	$1,200 00
1	Deputy collector and inspector	.....	1,200	1,200 00
2	Total	.....	.....	2,400 00
	Port of Middletown, district of Middletown.			
1	Collector	.....	2,500	2,500 00
1	Deputy collector	.....	1,600	1,600 00
1	Deputy collector and inspector	.....	1,200	1,200 00
1	Clerk	.....	600	600 00
4	Total	.....	.....	5,900 00
	Port of New Haven, district of New Haven.			
1	Collector	.....	4,000	4,000 00
1	Deputy collector and inspector	.....	1,800	1,800 00
1	.....do	.....	1,200	1,200 00
2	Clerks, each	.....	1,095	2,190 00
1	Messenger and porter	.....	500	500 00
1	Watchman	.....	400	400 00
6	Inspectors, each	$3 00	.....	6,570 00
1	Night-inspector	2 50	.....	912 50
14	Total	.....	.....	17,572 50
	Port of New London, district of New London.			
1	Collector	.....	2,000	2,000 00
1	Deputy collector and inspector	.....	1,600	1,600 00
3	Inspectors, each	3 00	.....	3,285 00
5	Total	.....	.....	6,885 00
	Port of Stonington, district of Stonington.			
1	Collector	.....	1,000	1,000 00
1	Deputy collector and inspector	.....	500	500 00
1	.....do	.....	400	400 00
1	.....do	.....	300	300 00
4	Total	.....	.....	2,200 00

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

NEW YORK.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of New York, district of New York.			
	COLLECTOR'S OFFICE.			
1	Collector	.....	$12,000	$12,000 00
11	Deputy collectors, each	.....	3,000	33,000 00
1	Auditor	.....	5,000	5,000 00
1	Assistant auditor	.....	3,500	3,500 00
1	Cashier	.....	5,000	5,000 00
1	Chief clerk	.....	5,000	5,000 00
1	Clerk	.....	2,700	2,700 00
10	Clerks, each	.....	2,500	25,000 00
1	Clerk	.....	2,400	2,400 00
19	Clerks, each	.....	2,200	41,800 00
37	.....do	.....	2,000	74,000 00
15	.....do	.....	1,800	27,000 00
48	.....do	.....	1,600	76,800 00
69	.....do	.....	1,400	96,600 00
96	.....do	.....	1,200	115,200 00
17	.....do	.....	1,000	17,000 00
2	..... do	.....	900	1,800 00
1	Measurer of marble	.....	2,000	2,000 00
2	Ushers, each	.....	1,200	2,400 00
1	Usher	.....	1,000	1,000 00
40	Messengers, each	.....	840	33,600 00
10	.....do	.....	720	7,200 00
2	.....do	.....	500	1,000 00
1	Bookbinder	.....	1,200	1,200 00
1	Detective	.....	1,200	1,200 00
1	Opener and packer	.....	1,095	1,095 00
1	Engineer	.....	1,500	1,500 00
1	.... do	.....	1,200	1,200 00
1	..... do	.....	1,000	1,000 00
4	Firemen, each	.....	720	2,880 00
16	Porters, each	.....	720	11,520 00
1	Master mechanic	.....	1,200	1,200 00
3	Carpenters, each	$3 00	.....	3,285 00
6	Watchmen, each	.....	1,000	6,000 00
30	.....do	3 00	.....	32,850 00
1	Watchman	2 50	.....	912 50
4	Sunday watchmen, each	2 50	.....	3,650 00
1	Inspector at Troy	4 00	.....	1,460 00
1	Scrubber	45 00*	.....	540 00
1	.....do	30 00*	.....	360 00
318	Inspectors, each	4 00	.....	464,280 00
4	Coast inspectors (in all)	.....	730	730 00
119	Night inspectors, each	3 00	.....	130,305 00
9	Inspectresses, each	3 00	.....	9,855 00
4	Weighers, each	.....	2,500	10,000 00
74	Assistant weighers, each	4 00	.....	108,040 00
1	Weighers' foreman	.....	1,600	1,600 00
3	Weighers' janitors, each	2 00	.....	2,190 00
3	Gaugers, each	.....	2,000	6,000 00
10	Assistant gaugers, each	4 00	.....	14,600 00
1	Assistant storekeeper	.....	1,000	1,000 00
995	Total	.....	.....	1,411,452 50
	NAVAL OFFICE.			
1	Naval officer	.....	8,000	8,000 00
1	Deputy naval officer	.....	2,500	2,500 00
5	Clerks, each	.....	2,500	12,500 00
8	.....do	.....	2,200	17,600 00
19	.....do	.....	2,000	38,000 00
6	.....do	.....	1,800	10,800 00
17	.....do	.....	1,600	27,200 00
1	.....do	.....	1,550	1,550 00
10	.....do	.....	1,400	14,000 00
13	.....do	.....	1,200	15,600 00
1	Clerk	.....	1,000	1,000 00
8	Messengers, each	.....	840	6,720 00
1	Messenger	.....	500	500 00
91	Total	.....	.....	155,970 00

* Per month.

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

NEW YORK—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of New York, district of New York—Continued.			
	SURVEYOR'S OFFICE.			
1	Surveyor	.....	$8,000	$8,000 00
1	Deputy surveyor	.....	2,500	2,500 00
1	Clerk (auditor)	.....	5,000	5,000 00
2	Clerks, each	.....	1,800	3,600 00
9	.....do	.....	1,600	14,400 00
4	.....do	.....	1,400	5,600 00
2	.....do	.....	1,200	2,400 00
2	Messengers, each	.....	840	1,680 00
5	.....do	.....	720	3,600 00
1	Messenger	.....	500	500 00
1	Scrubber	.....	360	360 00
10	Laborers (barge office), each	.....	780	7,800 00
7	Inspectors (for admeasurement of vessels), each	$4 00	.....	10,220 00
46	Total	.....	.....	65,660 00
	APPRAISER'S OFFICE.			
1	General appraiser	.....	3,000	3,000 00
1	Appraiser	.....	6,000	6,000 00
10	Assistant appraisers, each	.....	3,000	30,000 00
2	Clerks, each	.....	2,500	5,000 00
21	Examiners, each	.....	2,500	52,500 00
6	.....do	.....	2,200	13,200 00
13	.....do	.....	2,000	26,000 00
29	.....do	.....	1,800	52,200 00
2	.....do	.....	1,400	2,800 00
8	.....do	.....	1,200	9,600 00
1	Clerk	.....	2,200	2,200 00
2	Clerks, each	.....	2,000	4,000 00
3	..... do	.....	1,800	5,400 00
1	Clerk	.....	1,700	1,700 00
10	Clerks, each	.....	1,600	16,000 00
4	.....do	.....	1,200	4,800 00
14	Clerks and verifiers, each	.....	1,400	19,600 00
19	.....do	.....	1,200	22,800 00
1	Stenographer	.....	2,000	2,000 00
3	Samplers, each	.....	1,200	3,600 00
28	Messengers, each	.....	840	23,520 00
5	Foremen openers and packers, each	3 75	.....	5,868 75
1	Opener and packer	4 00	.....	1,252 00
92	Openers and packers, each	3 00	.....	86,388 00
18	.....do	2 75	.....	15,493 50
295	Total	.....	.....	414,922 25
	Total port of New York	.....	.....	2,048,004 75
	Port of Albany, district of Albany.			
1	Surveyor	.....	3,000	3,000 00
1	Deputy surveyor and inspector	4 00	.....	1,460 00
6	Deputy surveyors and inspectors, each	3 00	.....	6,570 00
8	Total	.....	.....	11,030 00
	Port of Cape Vincent, district of Cape Vincent.			
1	Collector	.....	2,000	2,000 00
1	Deputy collector	.....	1,500	1,500 00
1	.....do	.....	1,200	1,200 00
4	Deputy collectors and inspectors, each	3 00	.....	4,380 00
6	.....do	1 25	.....	2,737 50
13	Total	.....	.....	11,817 50
	Port of Buffalo, district of Buffalo Creek.			
1	Collector	.....	5,000	5,000 00
1	Appraiser	.....	3,000	3,000 00
1	Deputy collector and clerk	.....	2,500	2,500 00
1	.....do	.....	1,600	1,600 00
4	Clerks, each	.....	1,400	5,600 00
1	Deputy collector and clerk	.....	1,200	1,200 00

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

NEW YORK—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Buffalo, district of Buffalo Creek—Continued.			
2	Deputy collectors and inspectors, each	$4 00	.....	$2,920 00
5	.....do	3 50	.....	6,387 50
1	Inspector	4 00	.....	1,460 00
21	Deputy collectors and inspectors, each	3 00	.....	22,995 00
1	Night inspector	2 50	.....	912 50
1	Messenger	.....	$800	800 00
40	Total	.....	.....	54,375 00
	Port of Plattsburg, district of Champlain.			
1	Collector	.....	3,000	3,000 00
1	Deputy collector and inspector	.....	1,800	1,800 00
1	.....do	.....	1,200	1,200 00
1	Deputy collector and clerk	4 00	.....	1,460 00
1	Deputy collector and inspector	.....	1,000	1,000 00
5	Deputy collectors and inspectors, each	.....	900	4,500 00
1	Deputy collector and inspector	.....	700	700 00
1	.....do	3 00	.....	1,095 00
5	Deputy collectors and inspectors, each	2 45	.....	4,471 25
4	Deputy collectors and inspectors, season of navigation (7 months), each	2 45	.....	2,097 20
6	Deputy collectors and inspectors, each	2 20	.....	4,818 00
27	Total	.....	.....	26,141 45
	Port of Dunkirk, district of Dunkirk.			
1	Collector	.....	1,000	1,000 00
1	Total	.....	.....	1,000 00
	Port of Rochester, district of Genesee.			
1	Collector	.....	3,000	3,000 00
1	Deputy collector and clerk	.....	1,800	1,800 00
2	Deputy collectors and clerks, each	.....	1,200	2,400 00
1	Deputy collector and inspector	4 00	.....	1,460 00
1	Inspector	4 00	.....	1,460 00
6	Deputy collectors and inspectors, each	3 00	.....	6.570 00
10	Inspectors, during season of navigation (7 months), each	3 00	.....	6,420 00
22	Total	.....	.....	23,110 00
	Port of Suspension Bridge, district of Niagara.			
1	Collector	.....	4,000	4,000 00
1	Deputy collector and clerk	.....	2,000	2,000 00
1	Deputy collector, inspector, and clerk	.....	1,800	1,800 00
1	Deputy collector and clerk	.....	1,500	1,500 00
2	Deputy collectors and clerks, each	.....	1,400	2,800 00
1	Deputy collector	.....	1,200	1,200 00
1	Messenger and clerk	.....	600	600 00
2	Deputy collectors and inspectors, each	4 00	.....	2,920 00
2	Deputy collectors and inspectors, during navigation (7 months), each	4 00	.....	1,712 00
21	Deputy collectors and inspectors	3 00	.....	22,995 00
8	Deputy collectors and inspectors, during navigation (7 montha), each	3 00	.....	5,136 00
1	Inspectress	2 00	.....	730 00
42	Total	.....	....	47,393 00
	Port of Ogdensburg, district of Oswegatchie.			
1	Collector	.....	3,000	3,000 00
1	Deputy collector and inspector	.....	1,800	1,800 00
1	.....do	.....	1,500	1,500 00
3	Deputy collectors and inspectors, each	.....	1,200	3,600 00
1	Inspector	4 00	.....	1,460 00
10	Deputy collectors and inspectors, each	3 00	.....	10,950 00
2	.....do	2 20	.....	1,606 00
3	.....do	1 65	.....	1,806 75
1	Deputy collector and inspector	2 00	.....	730 00
1	Inspectress	1 00	.....	365 00
24	Total	.....	.....	26,817 75

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

NEW YORK—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Oswego, district of Oswego.			
1	Collector	.....	$3,000	$3,000 00
1	Deputy collector and clerk	.....	1,800	1,800 00
1	.....do	.....	1,600	1,600 00
2	Deputy collectors and clerks, each	.....	1,400	2,800 00
2	.....do	.....	1,000	2,000 00
1	Deputy collector and clerk	.....	900	900 00
2	Deputy collectors and inspectors, each	$3 00	.....	2,190 00
1	Deputy collector and inspector	2 20	.....	803 00
18	Deputy collectors and inspectors, during navigation (7 months), each	3 00	.....	11,556 00
29	Total	.....	.....	26,649 00
	Port of Patchogue, district of New York.			
1	Surveyor	.....	200	200 00
1	Total	.....	.....	200 00
	Port of Jefferson, district of New York.			
1	Surveyor	.....	200	200 00
1	Total	.....	.....	200 00
	Port of Sag Harbor, district of Sag Harbor.			
1	Collector	.....	500	500 00
1	Surveyor (at Greenport)	.....	500	500 00
2	Total	.....	.....	1,000 00

NEW JERSEY.

	Port of Tuckerton, district of Little Egg Harbor.			
1	Collector	.....	$600	$600 00
1	Deputy collector	.....	600	600 00
1	Inspector	$2 00	.....	730 00
3	Total	.....	.....	1,930 00
	Port of Newark, district of Newark.			
1	Collector	.....	1,200	1,200 00
1	Deputy collector and inspector	.....	1,200	1,200 00
1	.....do	3 00	.....	1,095 00
3	Total	.....	.....	3,495 00
	Port of Bridgeton, district of Bridgeton.			
1	Collector	.....	900	900
1	Total	.....	.....	900 00
	Port of Lamberton, district of Burlington.			
1	Collector	.....	300	300 00
1	Total	.....	.....	300 00
	Port of Somers Point, district of Great Egg Harbor.			
1	Collector	.....	600	600 00
1	Deputy collector	.....	600	600 00
1	Inspector and boatman	1 50	.....	547 50
3	Total	.....	.....	1,747 50
	Port of Perth Amboy, district of Perth Amboy.			
1	Collector	.....	2,000	2,000 00
1	Deputy collector	.....	1,200	1,200 00
1	Inspector and clerk	.....	840	840 00
2	Deputy collectors and inspectors, each	3 00	.....	2,190 00
1	Deputy collector and inspector	2 00	.....	730 00
1	Boatman and janitor	.....	480	480 00
7	Total	.....	.....	7,440 00

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

PENNSYLVANIA.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Erie, district of Erie.			
1	Collector	.....	$2,000	$2,000 00
1	Deputy collector and inspector	.....	1,600	1,600 00
3	Inspectors, during navigation (7 months), each	$3 00	.....	1,926 00
5	Total	.....	.....	5,526 00
	Port of Pittsburgh, district of New Orleans.			
1	Surveyor	.....	4,000	4,000 00
1	Deputy surveyor and clerk	.....	1,800	1,800 00
2	Deputy surveyors and clerks, each	.....	1,200	2,400 00
1	Inspector	4 00	.....	1,460 00
4	Inspectors, each	3 00	.....	4,380 00
1	Messenger	.....	600	600 00
10	Total	.....	.....	14,640 00
	Port of Philadelphia, district of Philadelphia.			
	COLLECTOR'S OFFICE.			
1	Collector	.....	8,000	8,000 00
2	Deputy collectors, each	.....	3,000	6,000 00
1	Cashier	.....	2,500	2,500 00
1	Auditor	.....	2,500	2,500 00
1	Assistant cashier	.....	2,000	2,000 00
2	Clerks, each	.....	2,000	4,000 00
1	Weigher	.....	2,000	2,000 00
1	Gauger	.....	2,000	2,000 00
1	Storekeeper	.....	2,000	2,000 00
5	Clerks, each	.....	1,800	9,000 00
12	.....do	.....	1,600	19,200 00
10	.....do	.....	1,400	14,000 00
8	.....do	.....	1,200	9,600 00
6	Inspectors, each	4 00	.....	8,760 00
73	.....do	3 50	.....	93,257 50
1	Captain of night inspectors	3 50	.....	1,277 50
17	Assistant weighers, each	.....	1,100	18,700 00
1	Inspectress	3 00	.....	1,095 00
37	Night inspectors, each	3 00	.....	40,515 00
2	Foremen, each	2 50	.....	1,825 00
4	Watchmen, each	2 50	.....	3,650 00
1	Measurer's laborer	2 50	.....	912 50
2	Gauger's laborers, each	2 55	.....	1,861 50
1	Watchman	.....	840	840 00
1	Foreman of weigher's laborers	.....	840	840 00
1	Stenciler	.....	840	840 00
1	Carpenter	.....	800	800 00
2	Watchmen, each	.....	720	1,440 00
4	Messengers, each	.....	720	2,880 00
2	Boatmen, each	.....	720	1,440 00
1	Marker	.....	720	720 00
17	Laborers, each	.....	700	11,900 00
1	Inspector	.....	600	600 00
221	Total	.....	.....	276,954 00
	NAVAL OFFICE.			
1	Naval officer	.....	5,000	5,000 00
1	Deputy naval officer	.....	2,500	2,500 00
1	Clerk	.....	2,000	2,000 00
2	Clerks, each	.....	1,800	3,600 00
1	Clerk	.....	1,400	1,400 00
1	.....do	.....	1,200	1,200 00
1	Messenger	.....	720	720 00
8	Total	.....	.....	16,420 00
	SURVEYOR'S OFFICE.			
1	Surveyor	.....	5,000	5,000 00
1	Deputy surveyor	.....	2,500	2,500 00
2	Clerks	.....	1,400	2,800 00
1	Clerk	.....	1,200	1,200 00
1	Messenger	.....	840	840 00
6	Total	.....	.....	12,340 00

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

PENNSYLVANIA—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Philadelphia, district of Philadelphia—Continued.			
	APPRAISER'S OFFICE.			
1	General appraiser	.....	$3,000	$3,000 00
1	Appraiser	.....	3,000	3,000 00
2	Assistant appraisers, each	.....	2,500	5,000 00
1	Examiner	.....	2,000	2,000 00
6	Examiners, each	.....	1,800	10,800 00
1	Clerk	.....	1,600	1,600 00
3	Clerks, each	.....	1,400	4,200 00
1	Clerk	.....	1,200	1,200 00
1	Examiner	.....	1,200	1,200 00
1	Special examiner of drugs	.....	1,000	1,000 00
15	Samplers and packers, each	.....	900	13,500 00
1	Messenger	.....	700	700 00
1	Watchman	.....	700	700 00
12	Laborers	.....	700	8,400 00
47	Total	.....	.....	56,300 00
	Total port of Philadelphia	.....	.....	362,014 00

DELAWARE.

	Port of Wilmington, district of Delaware.			
1	Collector	.....	$2,000	$2,000 00
1	Deputy collector and inspector	.....	1,600	1,600 00
2	Deputy collectors and inspectors, each	$2 75	.....	2,007 50
1	Deputy collector and inspector	1 65	.....	602 25
1	Deputy collector	.....	500	500 00
5	Boatmen, each	.....	300	1,500 00
11	Total	.....	.....	8,209 75

MARYLAND.

	Port of Baltimore, district of Baltimore.			
	COLLECTOR'S OFFICE.			
1	Collector	.....	$7,000	$7,000 00
2	Deputy collectors, each	.....	3,000	6,000 00
1	Deputy collector	.....	800	800 00
1	Auditor	.....	2,500	2,500 00
1	Assistant auditor	.....	1,800	1,800 00
1	Cashier	.....	2,500	2,500 00
1	Assistant cashier	.....	1,800	1,800 00
8	Clerks, each	.....	1,800	14,400 00
7	.....do	.....	1,600	11,200 00
9	.....do	.....	1,400	12,600 00
5	.....do	.....	1,200	6,000 00
1	Clerk	.....	1,000	1,000 00
1	Messenger and copyist	.....	1,000	1,000 00
2	Messengers and copyists, each	.....	900	1,800 00
4	Messengers, each	.....	720	2,880 00
1	Messenger	.....	840	840 00
2	Laborers, each	.....	720	1,440 00
1	Captain of watchmen	.....	1,000	1,000 00
4	Watchmen, each	.....	840	3,360 00
40	Inspectors, each	$3 50	.....	51,100 00
2	.....do	4 00	.....	2,920 00
1	Inspectress	.....	600	600 00
1	Fireman (steam-launch)	45 00*	.....	540 00
1	Boatman (acting pilot)	60 00*	.....	720 00
1	Boatman	45 00*	.....	540 00
1	.....do	40 00*	.....	480 00
1	Captain of night inspectors	3 50	.....	1,277 50
1	Lieutenant of night inspectors	3 00	.....	1,095 00
32	Night inspectors, each	3 00	.....	35,040 00

*Per month.

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

MARYLAND—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Baltimore, district of Baltimore—Continued.			
	COLLECTOR'S OFFICE—continued.			
2	Debenture markers, each	.....	$840	$1,680 00
1	Weigher	.....	2,000	2,000 00
11	Assistant weighers, each	.....	1,200	13,200 00
1	Assistant weigher (acting gauger)	.....	1,400	1,400 00
6	Assistant gaugers, each	$3 50	.....	7,665 00
1	Foreman of laborers	.....	840	840 00
3	Clerks, each	.....	1,200	3,600 00
1	Messenger	.....	660	660 00
1	do	.....	720	720 00
1	Clerk and storekeeper	.....	1,800	1,800 00
1	Clerk	.....	1,600	1,600 00
4	Laborers, each	.....	720	2,880 00
1	Engineer	.....	1,200	1,200 00
1	Fireman	.....	1,095	1,095 00
4	Porters, each	.....	820	3,280 00
173	Total	.....	.....	217,852 50
	NAVAL OFFICE.			
1	Naval officer	.....	5,000	5,000 00
1	Deputy	.....	2,500	2,500 00
2	Clerks, each	.....	1,600	3,200 00
3	.....do	.....	1,400	4,200 00
1	Clerk	.....	1,000	1,000 00
1	Messenger	.....	720	720 00
9	Total	.....	.....	16,620 00
	SURVEYOR'S OFFICE.			
1	Surveyor	.....	4,500	4,500 00
1	Deputy	.....	2,500	2,500 00
1	Clerk	.....	1,800	1,800 00
1	.....do	.....	1,200	1,200 00
1	Messenger	.....	720	720 00
5	Total	.....	.....	10,720 00
	APPRAISER'S OFFICE.			
1	General appraiser	.....	3,000	3,000 00
1	Appraiser	.....	3,000	3,000 00
1	Assistant appraiser	.....	2,500	2,500 00
3	Examiners, each	.....	1,800	5,400 00
3	.....do	.....	1,600	4,800 00
2	Clerks, each	.....	1,600	3,200 00
1	Foreman	.....	840	840 00
6	Laborers, each	.....	840	5,040 00
5	.....do	.....	720	3,600 00
1	Messenger	.....	720	720 00
24	Total	.....	.....	32,100 00
	Total port of Baltimore	.....	.....	277,292 50
	Port of Annapolis, district of Annapolis.			
1	Collector	.....	600	600 00
1	Deputy collector and inspector	80	.....	292 00
1	Boatman	.....	180	180 00
3	Total	.....	.....	1,072 00
	Port of Crisfield, district of Eastern Maryland.			
1	Collector	.....	1,200	1,200 00
1	Deputy collector and inspector	3 00	.....	1,095 00
2	Total	.....	.....	2,295 00

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

DISTRICT OF COLUMBIA.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Georgetown, district of Georgetown.			
1	Collector	.....	$2,000	$2,000 00
1	Deputy collector and inspector	.....	1,600	1,600 00
2	Deputy collectors and inspectors, each	$3 00	.....	2,190 00
4	Total	.....	.....	5,790 00

VIRGINIA.

	Port of Alexandria, district of Alexandria.			
1	Collector	.....	$900	$900 00
1	Deputy collector and inspector	.....	900	900 00
1	Inspector	$2 00	.....	730 00
3	Total	.....	.....	2,530 00
	Port of Cherrystone, district of Cherrystone.			
1	Collector	.....	900	900 00
2	Deputy collectors and inspectors, each	.....	900	1,800 00
1	Deputy collector, inspector, and boatman	.....	480	480 00
4	Total	.....	.....	3,180 00
	Port of Norfolk, district of Norfolk and Portsmouth.			
1	Collector	.....	2,500	2,500 00
1	Deputy collector	.....	1,600	1,600 00
1	Clerk	.....	1,400	1,400 00
1	Clerk	.....	1,200	1,200 00
1	Clerk	.....	900	900 00
1	Inspector	4 00	.....	1,460 00
3	Deputy collectors and inspectors, each	3 00	.....	3,285 00
1	Watchman	.....	720	720 00
1	Boatman	40 00*	.....	480 00
1	Boatman	30 00*	.....	360 00
2	Boatmen, each	35 00*	.....	840 00
14	Total	.....	.....	14,745 00
	Port of Petersburg, district of Petersburg.			
1	Collector	.....	1,000	1,000 00
1	Total	.....	.....	1,000 00
	Port of Richmond, district of Richmond.			
1	Collector	.....	1,500	1,500 00
1	Deputy collector and clerk	.....	1,400	1,400 00
1	Inspector and clerk	.....	1,200	1,200 00
1	Watchman	.....	720	720 00
2	Inspectors, each	3 00	.....	2,190 00
1	Deputy collector and inspector	2 00	.....	730 00
1	Boatman	35 00*	.....	420 00
8	Total	.....	.....	8,160 00
	Port of Tappahannock, district of Tappahannock.			
1	Collector	.....	600	600 00
1	Total	.....	.....	600 00

* Per month.

Estimate of expenses of collecting revenue from customs, &c.—Continued.

VIRGINIA—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Newport News, district of Yorktown.			
1	Collector	.....	$2,000	$2,000 00
3	Deputy collectors and inspectors, each	$3 00	.....	3,285 00
1	Inspector	2 50	.....	912 50
1	Deputy collector	.....	600	600 00
2	Boatmen, each	30 00*	.....	720 00
8	Total	.....	.....	7,517 50

WEST VIRGINIA.

	Port of Wheeling, district of New Orleans.			
1	Surveyor	.....	$1,000	$1,000 00
1	Clerk	.....	600	600 00
2	Total	.....	.....	1,600 00

NORTH CAROLINA.

	Port of Edenton, distrtct of Albemarle.			
1	Collector	.....	$600	$600 00
1	Deputy collector	.....	600	600 00
1	Deputy collector and inspector	.....	600	600 00
3	Total	.....	.....	1,800 00
	Port of Beaufort, district of Beaufort.			
1	Collector	.....	1,000	1,000 00
2	Deputy collectors, each	.....	480	960 00
1	Boatman	.....	240	240 00
4	Total	.....	.....	2,200 00
	Port of New Berne, district of Pamlico.			
1	Collector	.....	1,200	1,200 00
1	Deputy collector	.....	900	900 00
1	Deputy collector and messenger	.....	420	420 00
1	Deputy collector and inspector	$1 90	.....	693 50
2	Deputy collectors and inspectors, each	1 00	.....	730 00
4	Boatmen	.....	240	960 00
10	Total	.....	.....	4,903 50
	Port of Wilmington, district of Wilmington.			
1	Collector	.....	2,500	2,500 00
1	Deputy collector	.....	1,800	1,800 00
1	Deputy collector and clerk	.....	1,600	1,600 00
1	Clerk	.....	1,000	1,000 00
1	Messenger	.....	600	600 00
5	Inspectors, each	3 00	.....	5,475 00
2	Boatmen, each	35 00*	.....	840 00
2	.....do	30 00*	.....	720 00
14	Total	.....	.....	14,535 00

SOUTH CAROLINA.

	Port of Beaufort, district of Beaufort.			
1	Collector	.....	$2,000	$2,000 00
2	Deputy collectors and inspectors, each	$3 00	.....	2,190 00
4	Boatmen, each	35 00*	.....	1,680 00
7	Total	.....	.....	5,870 00

* Per month.

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

SOUTH CAROLINA—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Charleston, district of Charleston.			
1	Collector	.....	$3,000	$3,000 00
1	Deputy collector and clerk	.....	2,000	2,000 00
3	Deputy collectors and clerks, each	.....	1,500	4,500 00
1	Messenger	.....	730	730 00
2	Watchmen, each	.....	600	1,200 00
1	Chief inspector and boarding officer	$4 00	.....	1,460 00
4	Inspectors, each	3 00	.....	4,380 00
1	Inspector (quarantine, 6 months)	3 00	.....	550 00
4	Boatmen, each	.....	480	1,920 00
18	Total	.....	.....	19,740 00
	Port of Georgetown, district of Georgetown.			
1	Collector	.....	600	600 00
2	Boatmen, each	.....	300	600 00
3	Total	.....	.....	1,200 00

GEORGIA.

	Port of Atlanta.			
1	Surveyor	.....	$300	$300 00
1	Total	.....	.....	300 00
	Port of Brunswick, district of Brunswick.			
1	Collector	.....	2,000	2,000 00
3	Deputy collectors and inspectors, each	$3 00	.....	3,285 00
1	Inspector	3 00	.....	1,095 00
5	Boatmen, each	.....	300	1,500 00
10	Total	.....	.....	7,880 00
	Port of Saint Mary's, district of Saint Mary's.			
1	Collector	.....	900	900 00
1	Deputy collector	.....	900	900 00
1	Boatman	.....	300	300 00
3	Total	.....	.....	2,100 00
	Port of Savannah, district of Savannah.			
1	Collector	.....	4,000	4,000 00
1	Deputy collector	.....	2,000	2,000 00
1	Deputy collector and clerk	.....	1,500	1,500 00
2	Clerks, each	.....	1,500	3,000 00
1	Messenger	.....	720	720 00
2	Deputy collectors and inspectors, each	4 00	.....	2,920 00
3	Inspectors, each	3 00	.....	3,285 00
3	Night inspectors, each	2 00	.....	2,190 00
3	Boatmen, each	.....	600	1,800 00
1	Boatman	.....	360	360 00
18	Total	.....	.....	21,775 00

FLORIDA.

	Port of Apalachicola, district of Apalachicola.			
1	Collector	.....	$1,200	$1,200 00
1	Deputy collector and inspector	$3 00	.....	1,095 00
2	Total	.....	.....	2,295 00

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

FLORIDA—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Fernandina, district of Fernandina.			
1	Collector	.....	$ 1,200	$1,200 00
1	Deputy collector and inspector	$3 00	.....	1,095 00
1	Inspector	3 00	.....	1,095 00
1	.....do	2 00	.....	730 00
2	Boatmen, each	.....	300	600 00
6	Total	.....	.....	4,720 00
	Port of Key West, district of Key West.			
1	Collector	.....	4,000	4,000 00
1	Deputy collector and clerk	.....	2,000	2,000 00
3	Clerks, each	.....	1,200	3,600 00
1	Deputy collector and inspector at Tampa	.....	600	600 00
1	Inspector	3 50	.....	1,277 50
4	Inspectors, each	3 00	.....	4,380 00
3	do	1 50	.....	1,642 50
1	Night inspector	2 50	.....	912 50
1	Messenger	.....	730	730 00
1	Watchman	.....	730	730 00
4	Boatmen, each	.....	400	1,600 00
2	.....do	.....	300	600 00
23	Total	.....	.....	22,072 50
	Port of Pensacola, district of Pensacola.			
1	Collector	.....	3,000	3,000 00
1	Deputy collector	.....	1,800	1,800 00
1	Deputy collector and clerk	.....	1,200	1,200 00
1	Clerk	.....	1,000	1,000 00
6	Inspectors, each	3 00	.....	6,570 00
2	Watchmen, each	2 00	.....	1,460 00
1	Messenger	.....	600	600 00
2	Boatmen, each	.....	480	960 00
4	.....do	.....	420	1,680 00
19	Total	.....	.....	18,270 00
	Port of Saint Augustine, district of Saint Augustine.			
1	Collector	.....	600	600 00
1	Deputy collector at Indian River	.....	480	480 00
2	Boatmen, each	.....	240	480 00
4	Total	.....	.....	1,560 00
	Port of Jacksonville, district of Saint John's.			
1	Collector	.....	1,200	1,200 00
1	Deputy collector and inspector	3 00	.....	1,095 00
1	.....do	1 35	.....	492 25
1	Messenger	.....	300	300 00
1	Boatman	.....	240	240 00
5	Total	.....	.....	3,327 25
	Port of Cedar Keys, district of Saint Mark's.			
1	Collector	.....	1,200	1,200 00
1	Deputy collector and inspector	3 00	.....	1,095 00
1	.....do	3 00	.....	1,095 00
1	.....do	1 35	.....	492 25
1	Boatman	.....	600	600 00
5	Total	.....	.....	4,482 25

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

ALABAMA.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Mobile, district of Mobile.			
1	Collector	.....	$3,000	$3,000 00
1	Deputy collector and cashier	.....	1,800	1,800 00
1	Deputy collector, inspector, and clerk	.....	1,600	1,600 00
1	Clerk	.....	1,400	1,400 00
1	Inspector	$4 00	.....	1,460 00
6	Inspectors, each	3 00	.....	6,570 00
3	Night inspectors, each	2 00	.....	2,190 00
1	Messenger	.....	730	730 00
2	Deck-hands, each	.....	480	960 00
1	Coal-passer	.....	480	480 00
1	Boatman	.....	480	480 00
19	Total	.....	.....	20,670 00

MISSISSIPPI.

	Port of Natchez, district of Natchez.			
1	Collector	.....	$200	$200 00
1	Total	.....	.....	200 00
	Port of Shieldsborough, district of Pearl River.			
1	Collector	.....	1,200	1,200 00
3	Deputy collectors and inspectors, each	$3 00	.....	3,285 00
2	Boatmen, each	.....	360	720 00
6	Total	.....	.....	5,205 00
	Port of Vicksburg, district of Vicksburg.			
1	Collector	.....	600	600 00
1	Total	.....	.....	600 00

LOUISIANA.

	Port of New Orleans, district of New Orleans.			
	COLLECTOR'S OFFICE.			
1	Collector	.....	$7,000	$7,000 00
1	Deputy collector	.....	3,000	3,000 00
1	....do	.....	480	480 00
1	Auditor	.....	2,500	2,500 00
1	Cashier	.....	2,500	2,500 00
1	Chief clerk	.....	2,200	2,200 00
2	Clerks, each	.....	1,800	3,600 00
5	....do	.....	1,600	8,000 00
7	....do	.....	1,400	9,800 00
8	....do	.....	1,200	9,600 00
2	....do	.....	1,000	2,000 00
2	....do	.....	600	1,200 00
1	Messenger	.....	750	750 00
4	Messengers, each	.....	600	2,400 00
1	Captain of night watchmen	.....	800	800 00
4	Night watchmen, each	.....	600	2,400 00
1	Inspector	$4 00	.....	1,460 00
20	Inspectors, each	3 00	.....	21,900 00
10	....do	2 25	.....	8,212 50
1	Captain of night inspectors	3 00	.....	1,095 00
20	Night inspectors, each	2 00	.....	14,600 00
1	Weigher	.....	1,800	1,800 00
7	Assistant weighers, each	.....	1,200	8,400 00
2	Gaugers, each	.....	1,500	3,000 00
1	Clerk	.....	1,200	1,200 00
5	Laborers, each	.....	600	3,000 00
1	Marker	.....	600	600 00
1	Warehouse superintendent and inspector of cigars	.....	2,000	2,000 00
1	Storekeeper and clerk	.....	1,800	1,800 00
1	Messenger	.....	600	600 00
6	Laborers, each	.....	600	3,600 00
16	Boatmen, each	.....	600	9,600 00
136	Total	.....	.....	141,097 50

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

LOUISIANA—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of New Orleans, district of New Orleans—Continued.			
	NAVAL OFFICE.			
1	Naval officer	.....	$5,000	$5,000 00
1	Deputy naval officer	.....	2,500	2,500 00
1	Clerk	.....	1,800	1,800 00
1	.....do	.....	1,600	1,600 00
2	Clerks, each	.....	1,400	2,800 00
1	Messenger	.....	600	600 00
7	Total	.....	.....	14,300 00
	SURVEYOR'S OFFICE.			
1	Surveyor	.....	3,500	3,500 00
1	Deputy surveyor	.....	2,500	2,500 00
1	Clerk	.....	1,600	1,600 00
1	.....do	.....	1,400	1,400 00
1	.....do	.....	1,200	1,200 00
2	Messengers, each	.....	600	1,200 00
7	Total	.....	.....	11,400 00
	APPRAISER'S OFFICE.			
1	Appraiser	.....	3,000	3,000 00
2	Assistant appraisers, each	.....	2,500	5,000 00
1	Special examiner of drugs	.....	1,000	1,000 00
4	Examiners, each	.....	1,800	7,200 00
1	Clerk	.....	1,600	1,600 00
1	..... do	.....	800	800 00
1	Sampler	.....	750	750 00
2	Openers and packers, each	.....	720	1,440 00
1	Chief laborer	.....	800	800 00
6	Laborers, each	.....	600	3,600 00
1	Messenger	.....	600	600 00
21	Total	.....	.....	25,790 00
	Total port of New Orleans	.....	.....	192,587 50
	Port of Brashear, district of Teche.			
1	Collector	.....	1,200	1,200 00
2	Deputy collectors and inspectors, each	$3 00	.....	2,190 00
3	Boatmen, each	.....	480	1,440 00
6	Total	.....	.....	4,830 00

TEXAS.

	Port of Brownsville, district of Brazos de Santiago.			
1	Collector	.....	$2,000	$2,000 00
1	Deputy collector	.....	1,800	1,800 00
2	Deputy collectors, each	.....	1,600	3,200 00
1	Clerk	.....	1,600	1,600 00
1	Messenger	.....	750	750 00
1	Watchman	.....	750	750 00
1	Inspectress	$3 00	.....	1,095 00
14	Inspectors (mounted), each	*4 00	.....	20,440 00
7	Inspectors, each	3 50	.....	8,942 50
2	.....do	3 00	.....	2,190 00
31	Total	.....	.....	42,767 50
	Port of Corpus Christi, district of Corpus Christi.			
1	Collector	.....	2,000	2,000 00
2	Deputy collectors and inspectors, each	.....	1,600	3,200 00
1	Deputy collector and clerk	.....	1,200	1,200 00
4	Inspectors, each	*4 00	.....	5,840 00
6	Inspectors, each	3 50	.....	7,665 00
1	Boatman	2 00	.....	730 00
1	Porter	.....	420	420 00
1	.....do	.....	300	300 00
17	Total	.....	.....	21,355 00

* Includes 50 cents per day each for forage.

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

TEXAS—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Galveston, district of Galveston.			
1	Collector	.....	$4,000	$4,000 00
1	Deputy collector and clerk	.....	2,000	2,000 00
1	..... do	.....	1,800	1,800 00
1	.....do	.....	1,600	1,600 00
1	Acting appraiser	.....	1,800	1,800 00
2	Deputy collectors and clerks, each	.....	1,400	2,800 00
1	Clerk	.....	1,200	1,200 00
1	Porter	.....	500	500 00
1	Laborer	.....	480	480 00
1	Storekeeper	.....	860	860 00
1	Inspector	$4 00	.....	1,460 00
9	Inspectors, each	3 50	.....	11,497 50
4	Night inspectors, each	3 00	.....	4,380 00
1	Porter and messenger	2 00	.....	730 00
1	Laborer	.....	480	480 00
1	Machinist (steam launch)	.....	840	840 00
1	Fireman (steam launch)	.....	540	540 00
3	Boatmen (steam launch), each	.....	480	1,440 00
32	Total	.....	.....	38,407 50
	Port of El Paso, district of Paso del Norte.			
1	Collector	.....	2,000	2,000 00
1	Deputy collector	.....	1,800	1,800 00
1	Deputy collector and inspector	.....	1,600	1,600 00
1	Deputy collector and clerk	.....	1,200	1,200 00
*9	Inspectors, each	3 50	.....	11,680 00
1	Inspector	3 00	.....	1,095 00
1	Deputy collector and inspector	2 75	.....	1,003 75
1	.....do	2 00	.....	730 00
16	Total	.....	.....	21,108 75
	Port of Indianola, district of Saluria.			
1	Collector	.....	2,000	2,000 00
2	Deputy collectors and inspectors, each	.....	1,600	3,200 00
1	Deputy collector and inspector	4 00	.....	1,460 00
†5	Deputy collectors and inspectors, each	3 50	.....	6,570 00
†2	.....do	3 00	.....	2,372 50
1	Boatman	.....	480	480 00
1	Porter and messenger	.....	360	360 00
13	Total	.....	.....	16,442 50

TENNESSEE.

	Port of Chattanooga.			
1	Surveyor	.....	$350	$350 00
1	Total	.....	.....	350 00
	Port of Nashville.			
1	Surveyor	.....	600	600 00
1	Total	.....	.....	600 00
	Port of Memphis.			
1	Surveyor	.....	1,200	1,200 00
1	Deputy surveyor and clerk	.....	1,000	1,000 00
1	Porter	.....	180	180 00
3	Total	.....	.....	2,380 00

* 50 cents paid additional to one inspector for forage.
† 50 cents per diem additional to one at $3.50 and one at $3, for forage.

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

KENTUCKY.

No.	Designation.	Per diem.	a	Total.
	Port of Louisville.			
1	Surveyor	.....	$3,000	$3,000 00
1	Deputy surveyor and clerk	.....	1,600	1,600 00
1	.....do	.....	1,400	1,400 00
1	.....do	.....	1,200	1,200 00
1	Inspector, examiner, and storekeeper	$3 50	.....	1,277 50
1	Inspector, weigher, and gauger	3 00	.....	1,095 00
1	Messenger		720	720 00
1	Laborer		360	360 00
8	Total	.....	.....	10,652 50

OHIO.

	Port of Cincinnati.			
1	Surveyor	.....	$4,000	$4,000 00
1	Appraiser	.....	3,000	3,000 00
1	Deputy surveyor	.....	2,000	2,000 00
1	Examiner	.....	1,800	1,800 00
2	Deputy surveyors and clerks, each	.....	1,400	2,800 00
3	Clerks, each	.....	1,200	3,600 00
1	Clerk	.....	1,000	1,000 00
1	Opener and packer	.....	900	900 00
1	Porter	.....	720	720 00
1	Messenger	.....	480	480 00
1	Laborer	.....	600	600 00
1	Clerk and admeasurer	$3 00	.....	1,095 00
1	Inspector, weigher, gauger, and measurer	4 00	.....	1,460 00
3	Inspectors, each	3 50	.....	3,832 50
1	Watchman	.....	60	60 00
20	Total	.....	.....	27,347 50
	Port of Cleveland, district of Cuyahoga.			
1	Collector	.....	3,000	3,000 00
1	Appraiser	.....	3,000	3,000 00
1	Deputy collector and clerk	.....	1,800	1,800 00
1	.....do	.....	1,400	1,400 00
2	Clerks, each	.....	1,200	2,400 00
1	Opener and packer and messenger	.....	600	600 00
1	Clerk	.....	900	900 00
1	Deputy collector and inspector	3 50	.....	1,277 50
1	.....do	05	.....	18 25
4	Inspectors, each	3 00	.....	4,380 00
1	Deputy collector and night inspector	2 50	.....	912 50
1	Watchman	*2 50	.....	1,055 00
2	Deputy collectors and inspectors, each	1 30	.....	949 00
2	.....do	80	.....	584 00
20	Total	.....	.....	22,276 25
	Port of Sandusky, district of Sandusky.			
1	Collector	.....	1,500	1,500 00
1	Deputy collector and inspector	.....	1,000	1,000 00
1	.....do	.....	300	300 00
2	Deputy collectors and inspectors, each	1 10	.....	803 00
2	.....do	55	.....	200 75
1	Deputy collector and inspector	40	.....	146 00
1	.....do	30	.....	109 50
9	Total	.....	.....	4,059 25
	Port of Toledo, district of Miami.			
1	Collector	.....	2,000	2,000 00
1	Deputy collector and inspector	.....	1,400	1,400 00
1	.....do	.....	1,200	1,200 00
2	Deputy collectors and inspectors during navigation (7 months), each	3 00	.....	1,284 00
5	Total	.....	.....	5,884 00

* $2.50 paid extra for each holiday and Sunday.

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

INDIANA.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Evansville.			
1	Surveyor	.....	$1,200	$1,200 00
1	Total	.....	.....	1,200 00
	Port of Indianapolis.			
1	Surveyor	.....	2,000	2,000 00
1	Deputy surveyor and inspector	$3 00	.....	1,095 00
1	Opener and packer	.....	600	600 00
3	Total	.....	.....	3,695 00

ILLINOIS.

	Port of Cairo.			
1	Surveyor	.....	$1,000	$1,000 00
1	Total	.....	.....	1,000 00
	Port of Chicago, district of Chicago.			
1	Collector	.....	7,000	7,000 00
1	Appraiser	.....	3,000	3,000 00
1	Surveyor	.....	350	350 00
4	Inspectors, each	$4 00	.....	5,840 00
9	..do	3 50	.....	11,497 50
27	Inspectors (season of navigation, 7 months), each	3 00	.....	17,334 00
1	Chief weigher and gauger	.....	1,500	1,500 00
2	Assistant weighers and gaugers	4 00	.....	2,920 00
1	Assistant weigher and gauger	3 50	.....	1,277 50
1	.....do	3 50	.....	1,277 50
1	Examiner	.....	1,600	1,600 00
2	Examiners, each	.....	2,000	4,000 00
1	Examiner	.....	1,400	1,400 00
1	.....do	.....	1,800	1,800 00
2	Openers and packers, each	2 50	.....	1,825 00
1	Messenger	2 00	.....	730 00
2	Watchmen, each	2 50	.....	1,825 00
1	Opener and packer	2 00	.....	730 00
8	Laborers, each	2 00	.....	5,840 00
1	Deputy collector (7 months, during navigation)	.....	360	210 00
1	Messenger	2 50	.....	912 50
2	Deputy collectors and clerks, each	.....	2,500	5,000 00
4	Clerks, each	.....	2,200	8,800 00
1	Deputy collector and clerk	.....	3,000	3,000 00
3	Clerks, each	.....	1,800	5,400 00
7	..... do	.....	1,600	11,200 00
7	.....do	.....	1,400	9,800 00
5	.....do	.....	1,200	6,000 00
2	.....do	.....	1,000	2,000 00
1	Messenger	.....	900	900 00
1	.....do	.....	840	840 00
1	.....do	.....	780	780 00
103	Total	.....	.....	126,589 00
	Port of Galena.			
1	Surveyor	.....	600	600 00
1	Total	.....	.....	600 00

MISSOURI.

	Port of Kansas City.			
1	Surveyor	.....	$2,000	$2,000 00
1	Deputy surveyor and inspector	$3 00	.....	1,095 00
2	Total	.....	.....	3,095 00

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

MISSOURI—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Saint Joseph.			
1	Surveyor	.....	$1,200	$1,200 00
1	Deputy surveyor	.....	1,000	1,000 00
2	Total	.....	.....	2,200 00
	Port of Saint Louis.			
1	Surveyor	.....	5,000	5,000 00
1	Appraiser	.....	3,000	3,000 00
1	Deputy surveyor and clerk	.....	2,500	2,500 00
1	....do	.....	2,000	2,000 00
1	....do	.....	1,800	1,800 00
2	Deputy surveyors and inspectors, each	.....	1,600	3,200 00
1	Clerk	.....	1,500	1,500 00
1	....do	.....	1,400	1,400 00
1	Examiner	.....	1,400	1,400 00
1	Assistant weigher, gauger, and inspector	.....	1,000	1,000 00
1	Clerk	.....	1,400	1,400 00
1	....do	.....	1,200	1,200 00
1	....do	.....	1,100	1,100 00
1	....do	.....	900	900 00
1	Messenger	.....	840	840 00
2	Inspectors, each	$4 00	.....	2,920 00
2	....do	3 50	.....	2,555 00
3	....do	3 00	.....	3,285 00
1	Watchman	2 50	.....	912 50
1	Sampler	2 50	.....	912 50
3	Laborers, each	.....	480	1,440 00
1	Opener and packer	2 00	.....	730 00
29	Total	.....	.....	40,995 00

MICHIGAN.

	Port of Detroit, district of Detroit.			
1	Collector	.....	$4,000	$4,000 00
1	Appraiser	.....	3,000	3,000 00
1	Deputy collector and clerk	.....	2,000	2,000 00
1	Deputy collector and examiner	.....	1,600	1,600 00
1	Cashier	.....	1,800	1,800 00
1	Deputy collector and clerk	.....	1,600	1,600 00
1	Deputy collector and inspector	.....	1,600	1,600 00
1	Deputy collector and clerk	.....	1,600	1,600 00
3	Deputy collectors and clerks, each	.....	1,400	4,200 00
1	Deputy collector and clerk	.....	1,400	1,400 00
1	Deputy collector and inspector	.....	1,200	1,200 00
1	Deputy collector and clerk	.....	1,000	1,000 00
7	Deputy collectors and clerks, each	.....	900	6,300 00
2	Deputy collectors and inspectors, each	.....	900	1,800 00
2	....do	$3 50	.....	2,555 00
5	....do	3 00	.....	5,475 00
17	....do	2 50	.....	15,512 50
3	Deputy collectors and clerks, each	2 50	.....	2,737 50
1	Deputy collector and inspector	1 50	.....	547 50
2	Inspectresses, each	1 50	.....	1,095 00
2	Deputy collectors and clerks, each	1 00	.....	730 00
2	....do	65	.....	474 50
6	Deputy collectors and inspectors, each	30	.....	657 00
1	Deputy collector and inspector	35	.....	127 75
1	Messenger	.....	730	730 00
1	Laborer	2 00	.....	730 00
66	Total	.....	.....	64,471 75
	Port of Port Huron, district of Huron.			
1	Collector	.....	3,000	3,000 00
1	Deputy collector	.....	1,800	1,800 00
1	Deputy collector, cashier, and chief clerk	.....	1,600	1,600 00
2	Deputy collectors and clerks, each	.....	1,400	2,800 00
2	Deputy collectors and inspectors, each	.....	1,400	2,800 00
1	Deputy collector and clerk	.....	1,200	1,200 00

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

MICHIGAN—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Port Huron, district of Huron—Continued.			
2	Deputy collectors and inspectors, each	.....	$1,200	$2,400 00
4	.....do	.....	1,095	4,380 00
1	Deputy collector and inspector	.....	1,000	1,000 00
9	Deputy collectors and inspectors, each	.....	900	8,100 00
1	Clerk	.....	900	900 00
3	Deputy collectors, each	.....	900	2,700 00
1	Deputy collector and clerk	.....	800	800 00
1	Deputy collector and messenger	.....	730	730 00
2	Deputy collectors and inspectors, each	.....	730	1,460 00
1	Watchman	.....	730	730 00
*1	Deputy collector and inspector	.....	600	350 00
2	Deputy collectors and inspectors, each	.....	420	840 00
1	Deputy collector and inspector	.....	400	400 00
*4	Deputy collectors and inspectors	.....	300	700 00
*1	Deputy collector and inspector	.....	182	107 00
5	Deputy collectors and inspectors, each	$3 00	.....	5,475 00
4	.....do	2 50	.....	3,650 00
1	Inspector	2 00	.....	730 00
*1	Deputy collector and inspector	50	.....	107 00
53	Total	.....	.....	48,759 00
	Port of Grand Haven, district of Michigan.			
1	Collector	.....	2,000	2,000 00
1	Deputy collector	.....	1,200	1,200 00
1	Deputy collector and inspector	2 50	.....	912 50
*1	.....do	1 85	.....	395 90
1	..... do	1 65	.....	602 25
1	.....do	1 30	.....	474 50
*1	.....do	85	.....	181 90
1	.....do	75	.....	273 75
*2	Deputy collectors and inspectors, each	75	.....	321 00
*3	.....do	65	.....	417 30
*1	Deputy collector and inspector	60	.....	128 40
*1	.....do	55	.....	117 70
*1	.....do	50	.....	107 00
*1	.....do	1 00	.....	214 00
*1	.....do	05	.....	10 70
1	Deputy collector and clerk	.....	720	720 00
19	Total	.....	.....	8,076 90
	Port of Marquette, district of Superior.			
1	Collector	.....	2,000	2,000 00
1	Deputy collector	.....	1,200	1,200 09
1	.....do	.....	1,000	1,000 00
1	Deputy collector and inspector	3 30	.....	1,204 50
2	Deputy collectors and inspectors, each	3 00	.....	2,190 00
1	Deputy collector and inspector	1 65	.....	602 25
3	Deputy collectors and inspectors, each	80	.....	876 00
1	Deputy collector and inspector	75	.....	273 75
3	Deputy collectors and inspectors, each	25	.....	273 75
14	Total	.....	.....	9,620 25

* Season of navigation—7 months.

WISCONSIN.

	Port of La Crosse.			
1	Surveyor	.....	$1,200	$1,200 00
1	Total	.....	.....	1,200 00
	Port of Milwaukee, district of Milwaukee.			
1	Collector	.....	3,000	3,000 00
1	Deputy collector and clerk	.....	1,800	1,800 00
1	.....do	.....	1,600	1,600 00
1	.....do	.....	1,200	1,200 00

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

WISCONSIN—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Milwaukee, district of Milwaukee—Continued.			
1	Opener and packer	.....	$720	$720 00
1	Deputy collector and inspector	$4 00	.....	1,460 00
1	.....do	3 00	.....	1,095 00
1	.....do	1 65	.....	602 25
1	.....do	85	.....	310 25
1	.....do	80	.....	292 00
1	.....do	1 15	.....	419 75
1	.....do	40	.....	146 00
12	Total	.....	.....	12,645 25

IOWA.

	Port of Burlington.			
1	Surveyor	.....	$600	$600 00
1	Total	.....	.....	600 00
	Port of Dubuque.			
1	Surveyor	.....	600	600 00
1	Total	.....	.....	600 00

NEBRASKA.

	Port of Omaha.			
1	Surveyor	.....	$1,200	$1,200 00
1	Deputy surveyor and inspector	$3 00	.....	1,095 00
2	Total	.....	.....	2,295 00

MINNESOTA.

	Port of Duluth, district of Duluth.			
1	Collector	.....	$1,500	$1,500 00
1	Deputy collector and inspector	.....	1,400	1,400 00
*1	.....do	$3 00	.....	642 00
1	.....do	3 00	.....	1,095 00
4	Total	.....	.....	4,637 00
	Port of Saint Vincent, district of Minnesota.			
1	Collector	.....	2,000	2,000 00
2	Deputy collectors, each	.....	1,800	3,600 00
1	Deputy collector	.....	1,600	1,600 00
2	Deputy collectors and inspectors, each	4 00	.....	2,920 00
6	.....do	3 50	.....	7,665 00
8	.....do	3 00	.....	8,760 00
20	Total	.....	.....	26,545 00

* Season of navigation—7 months.

MONTANA.

	Port of Fort Benton, district of Montana and Idaho.			
1	Collector	.....	$1,200	$1,200 00
1	Total	.....	.....	1,200 00

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

CALIFORNIA.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Eureka, district of Humboldt.			
1	Collector	.....	$1,200	$1,200 00
1	Inspector	.....	1,000	1,000 00
2	Total	.....	.....	2,200 00
	Port of San Diego, district of San Diego.			
1	Collector	.....	1,500	1,500 00
1	Deputy collector	.....	1,400	1,400 00
1	Inspector	$4 00	.....	1,460 00
1	.....do	3 00	.....	1,095 00
4	Total	.....	.....	5,455 00
	Port of San Francisco, district of San Francisco.			
	COLLECTOR'S OFFICE.			
1	Collector	.....	7,000	7,000 00
2	Deputy collectors, each	.....	3,000	6,000 00
1	Auditor	.....	2,500	2,500 00
1	Assistant auditor	.....	2,000	2,000 00
1	Cashier	.....	2,500	2,500 00
1	Assistant cashier	.....	1,800	1,800 00
1	Clerk	.....	2,000	2,000 00
1	.....do	.....	1,800	1,800 00
1	.....do	.....	2,000	2,000 00
13	Clerks, each	.....	1,800	23,400 00
4	.....do	.....	1,600	6,400 00
3	.....do	.....	1,400	4,200 00
2	.....do	.....	1,200	3,600 00
2	Messengers, each	.....	900	1,800 00
1	Messenger	.....	600	600 00
3	Watchmen, each	.....	900	2,700 00
52	Inspectors, each	4 00	.....	75,920 00
1	Inspectress	3 00	.....	1,095 00
1	Inspector	.....	1,000	1,000 00
31	Night inspectors, each	3 00	.....	33,945 00
3	Weighers, each	.....	2,000	6,000 00
16	Assistant weighers, each	.....	1,200	19,200 00
1	Gauger	.....	2,000	2,000 00
1	Assistant gauger	.....	900	900 00
1	Deputy collector and warehouse superintendent	.....	3,000	3,000 00
1	Warehouse superintendent	.....	1,800	1,800 00
1	Clerk	.....	2,000	2,000 00
4	Clerks, each	.....	1,800	7,200 00
4	.....do	.....	1,600	6,400 00
2	.....do	.....	1,200	2,400 00
1	Messenger	.....	900	900 00
1	Foreman of laborers	.....	1,200	1,200 00
13	Laborers, each	.....	900	11,700 00
1	Doorkeeper	.....	1,200	1,200 00
3	Watchmen, each	.....	900	2,700 00
2	Boatmen, each	.....	900	1,800 00
179	Total	.....	.....	252,660 00
	NAVAL OFFICE.			
1	Naval officer	.....	5,000	5,000 00
1	Deputy officer	.....	2,500	2,500 00
6	Clerks, each	.....	1,800	10,800 00
1	Clerk	.....	1,600	1,600 00
2	Clerks, each	.....	1,400	2,800 00
1	Messenger	.....	1,000	1,000 00
12	Total	.....	.....	23,700 00
	SURVEYOR'S OFFICE.			
1	Surveyor	.....	5,000	5,000 00
1	Deputy surveyor	.....	2,500	2,500 00
2	Clerks, each	.....	1,800	3,600 00
1	Messenger	.....	900	900 00
5	Total	.....	.....	12,000 00

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

CALIFORNIA—Continued.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of San Francisco, district of San Francisco—Continued.			
	APPRAISER'S OFFICE.			
1	Appraiser	.....	$3,000	$3,000 00
3	Assistant appraisers, each	.....	2,500	7,500 00
1	Special examiner of drugs	.....	2,000	2,000 00
5	Examiners, each	.....	2,000	10,000 00
1	Examiner	.....	1,600	1,600 00
1	Clerk	.....	1,800	1,800 00
1	Superintendent of laborers	.....	1,200	1,200 00
4	Samplers, each	.....	1,200	4,800 00
12	Laborers, each	.....	900	10,800 00
1	Messenger	.....	900	900 00
30	Total	.....	.....	43,600 00
	Total port of San Francisco	.....	.....	331,960 00
	Port of Wilmington, district of Wilmington.			
1	Collector	.....	2,000	2,000 00
1	Deputy collector	.....	1,500	1,500 00
2	Deputy collectors and inspectors, each	.....	1,000	2,000 00
1	Deputy collector and inspector	$3 00	.....	1,095 00
5	Total	.....	.....	6,595 00

OREGON.

	Port of Astoria, district of Oregon.			
1	Collector	.....	$2,500	$2,500 00
1	Deputy collector	.....	1,800	1,800 00
1	Deputy collector and inspector	.....	1,600	1,600 00
2	Deputy collectors and inspectors, each	$4 00	.....	2,920 00
2	Boatmen, each	.....	480	960 00
7	Total	.....	.....	9,780 00
	Port of Coos Bay, district of Southern Oregon.			
1	Collector	.....	1,000	1,000 00
2	Deputy collectors, each	.....	1,000	2,000 00
3	Total	.....	.....	3,000 00
	Port of Portland, district of Willamette.			
1	Collector	.....	4,000	4,000 00
1	Appraiser	.....	3,000	3,000 00
1	Deputy collector and clerk	.....	2,500	2,500 00
1	.....do	.....	2,200	2,200 00
1	Clerk	.....	1,400	1,400 00
1	.....do	.....	1,600	1,600 00
1	Opener and packer	.....	1,000	1,000 00
6	Inspectors, each	4 00	.....	8,760 00
4	Night inspectors, each	2 50	.....	3,650 00
17	Total	.....	.....	28,110 00
	Port of Yaquina, district of Yaquina.			
1	Collector	.....	1,200	1,200 00
1	Total	.....	.....	1,200 00

Estimate of expenses of collecting the revenue from customs, &c.—Continued.

WASHINGTON TERRITORY.

No.	Designation.	Per diem.	Per annum.	Total.
	Port of Port Townsend, district of Puget Sound.			
1	Collector	.....	$2,500	$2,500 00
1	Deputy collector and clerk	.....	2,000	2,000 00
3	Deputy collectors and clerks, each	.....	1,600	4,800 00
1	Clerk	.....	1,200	1,200 00
3	Inspectors, each	.....	1,200	3,600 00
4	Deputy collectors and inspectors, each	$4 00	.....	5,840 00
2	.....do	3 50	.....	2,555 00
1	Inspector	2 50	.....	912 50
3	Boatmen (50 cents per diem each for two of them for rations), each	.....	600	2,165 00
1	Night inspector	.....	900	900 00
20	Total	.....	.....	26,472 50

ALASKA.

	Port of Sitka, district of Alaska.			
1	Collector	.....	$2,500	$2,500 00
4	Deputy collectors and inspectors, each	.....	1,400	5,600 00
1	Deputy collector	.....	1,200	1,200 00
1	Inspector	$3 00	.....	1,095 00
1	Inspector afloat	3 00	.....	1,095 00
1	Watchman	.....	288	288 00
9	Total	.....	.....	11,778 00

COLORADO.

	Port of Denver.			
1	Surveyor	.....	$1,500	$1,500 00
1	Deputy surveyor and inspector	$3 00	.....	1,095 00
2	Total	.....	.....	2,595 00

MISCELLANEOUS ITEMS.

For temporary employés when deemed necessary by the Secretary of the Treasury, rents, labor, stationery and supplies for custom-houses, traveling and incidental expenses in the several collection districts	$920,623 02
For salaries and traveling expenses of special agents	100,000 00
For detection and prevention of fraud upon the customs revenue	100,000 00
For salaries and traveling expenses of additional inspectors of customs, appointed by the Secretary of the Treasury	40,000 00
Total for miscellaneous items	1,160,623 02

For the compensation of storekeepers of bonded warehouses, at a rate not exceeding $1,400 each per annum, night services of inspectors and other officers, special services and expenses of customs officers, traveling expenses of examiners of machinery, and compensation of merchant appraisers, there are hereby appropriated, out of any moneys in the Treasury not otherwise appropriated, such sums as may be collected for said purposes respectively.

RECAPITULATION.

Total salaries	$5,295,138 60
Total for miscellaneous items	1,160,623 02
Total amount of estimate	6,455,761 62

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 35.

CONTINGENT FUND, POST-OFFICE DEPARTMENT.

LETTER

FROM

THE POSTMASTER GENERAL,

TRANSMITTING

Statement of expenditures of the contingent fund of the Post-Office Department for the fiscal year ending June 30, 1884.

DECEMBER 15, 1884.—Referred to the Committee on Expenditures in the Post-Office Department and ordered to be printed.

POST-OFFICE DEPARTMENT,
OFFICE OF THE POSTMASTER-GENERAL,
Washington, D. C., December 15, 1884.

SIR: I have the honor to transmit herewith, in conformity with the tenth section of the act approved June 8, 1872, a detailed statement of the expenditures made from the contingent fund of this Department for the fiscal year ending June 30, 1884.

Very respectfully,

JNO. SCHUYLER CROSBY,
Acting Postmaster-General.

Hon. JOHN G. CARLISLE,
Speaker of the House of Representatives.

Expenditures under the appropriation for the contingent expenses of the Post-Office Department for the fiscal year ending June 30, 1884.

STATIONERY.

Date.	To whom paid.	On what account.	Amount.
1883.			
Aug. 7	G. A. Whitaker		$158 19
13	J. L. Kervand	Lithographing	24 00
18	J. D. Free, jr	Ink, &c	62 28
21	William Ballantyne & Son	Envelopes	125 90
21	do	Erasers, &c	277 38
22	Wyckoff, Seamans & Benedict		1 00
25	Mrs. Joseph Ross	Knives	48 00
29	C. W. Thorn & Co	Ink, &c	104 05
29	do	Blotting paper	289 10
Sept. 4	W. F. Lutz	Stamps	31 25
5	William Ballantyne & Son	Bands	829 32
7	J. L. Kervand	Lithographing	25 80

Expenditures under the appropriation for the contingent expenses of the Post-Office Department, &c.—Continued.

STATIONERY—Continued.

Date.	To whom paid.	On what account.	Amount.
1883.			
Sept. 8	John R. Mahoney	Paste	$25 00
13	William Ballantyne & Son	Pens	465 66
13	George McDowell & Co	Paper	143 40
13	J. R. Michael	Pencils	274 00
13	....do	Press-books	301 35
13	....do	Pencils	183 20
13	....do	Ink	58 50
13	....do	....do	135 80
Oct. 25	J. L. Kervand		15 00
Nov. 7	W. A. Wheeler, jr	Pen-racks, &c	180 60
7	White, Corbin & Co	Envelopes	74 57
7	Platner & Porter Manufacturing Company	Paper	855 67
7	J. R. Michael	Press-books	92 25
7	Holyoke Envelope Company	Envelopes	407 91
10	W. F. Lutz	Stamps	10 00
10	Charles Fischer	Envelope knives	27 00
14	J. L. Kervand	Lithographing	29 40
22	William H. Myers	Opening knives	6 00
27	John R. Mahoney	Paste	25 00
Dec. 5	A. M. Gangewer	Pin cushions	40 00
10	William F. Lutz	Stamps, &c	9 00
18	J. L. Kervand	Lithographing	18 00
1884.			
Jan. 5	C. W. Thorn & Co	Sponge cups	8 45
5	J. B. Adams		273 30
8	J. L. Kervand	Lithographing	25 00
16	John R. Mahoney	Paste	18 75
19	C. M. Thorn & Co	Pins, &c	59 30
19	William F. Lutz	Dating stamps	22 85
22	N. M. Baldwin	Mucilage	28 20
22	J. R. Michael	Twine	8 50
23	Platner & Porter Manufacturing Company	Paper	27 56
24	William Ballantyne & Son	Envelopes	37 50
29	J. L. Kervand	Lithographing	24 80
31	Platner & Porter Manufacturing Company	Paper	212 00
Feb. 1	William Ballantyne & Son	Erasers	165 60
16	William F. Lutz	Stamps	14 75
Mar. 1	J. L. Kervand	Lithographing	29 60
1	J. D. Free, jr	Paper-folders, &c	33 80
1	G. C. Maynard	Paper	12 00
11	J. B. Adams		126 25
11	J. J. Chapman	Taste	5 76
12	Platner & Porter Manufacturing Company	Paper	68 00
12	William Ballantyne & Son	Pens	183 42
12	William A. Wheeler, jr	Paper-fasteners	35 40
12	George McDowell & Co	Note paper	47 00
12	James R. Michael	Pencils	138 30
14	J. E. Brophy	Stamp	15 00
24	J. L. Kervand	Lithographing	46 00
29	John R. Mahoney	Paste	25 00
Apr. 3	Wyckoff Seamans & Benedict		2 00
15	Platner & Porter Manufacturing Company	Paper	20 00
15	W. A. Wheeler, jr		16 20
18	F. M Thornett	Fountain pen	13 50
18	J. L. Kervand	Lithographing	19 60
19	W. F. Lutz	Stamps	16 50
24	William Ballantyne & Son	Envelopes	271 46
May 14	National Electric Company	Paper	12 00
16	John R. Mahoney	Paste	25 00
17	G. A. Whitaker	Penholders	36 25
July 26	C. W. Thorn & Co	Pins	174 55
26	J. L. Kervand	Lithographs	56 00
26	L. e Crandall	Advertisements	14 40
Aug. 1	National Electric Company	Carbons	3 60
Aug. 2	E Morrison	Paper	144 68
2	W. F. Lutz	Stamps	13 00
5	J. B. Adams		250 85
5	Holyoke Envelope Company	Envelopes	218 45
5	Platner & Porter Manufacturing Company	Paper	159 00
9	The Republic	Advertisements	16 80
9	Charles Fischer	Envelope knives	21 00
12	J. C. Parker	Paper	8 00
12	George McDowell & Bro	....do	32 90
12	New York Herald	Advertisements	46 80
12	The Sentinel Company	....do	12 25
12	Indianapolis Times	....do	14 84
12	Evening Post	....do	25 60
12	John C. New & Son	....do	8 77
13	Springfield Republican	....do	7 60

Expenditure under the appropriation for the contingent expenses of the Post-Office Department, &c.—Continued.

STATIONERY—Continued.

Date.	To whom paid.	On what account.	Amount.
1883.			
Aug. 13	Chicago Daily News	Advertisements	$48 00
13	Sunday Herald	do	11 70
13	Inter-Ocean Publishing Company	do	18 51
13	Commercial Gazette	do	19 25
13	Roland Worthington & Co	do	15 75
13	Cincinnati Times-Star Company	do	24 00
13	Philadelphia Times	do	21 60
13	New York Zeitung	do	26 40
13	North American	do	31 20
13	Globe Printing Company	do	22 61
13	New York Times	do	36 00
22	John R. Wilson	do	17 00
	Total		8,899 33

FUEL AND REPAIRS TO ENGINES, BOILERS, AND HEATING APPARATUS.

Sept. 18	S. A. Gaskins	Repairs	$50 00
22	Robert Boyd	Packing, &c	69 15
25	Bartlett, Hayward & Co		58 25
Oct. 5	Evening Star Newspaper Company	Advertising	25 20
5	Sunday Herald	do	20 47
6	The Washington Post	do	25 20
12	National Republican Company	do	21 50
20	Burns & Creecy	Flagging	110 00
20	J. Q. Thompson	Advertising	23 95
22	The Capital	do	11 19
23	J. McKnight	do	46 50
26	Burns & Creecy	Hauling	55 00
26	do	do	50 00
Nov. 1	S. A. Gaskins	Labor	376 88
2	Clarke & Given	Coal and wood	2,430 65
2	do	do	404 58
3	A. Lindsay	Hauling	27 00
5	W. H. West & Bro	Brick	90 00
10	Louis Goodrick	Sand	44 00
13	William O. Saville	Inspecting boilers	8 60
10	Samuel A. Gaskins	Repairs	171 00
17	J. S. Fitzhugh	Labor	10 00
28	Samuel A. Gaskins & Co	Lime, &c	5 55
Dec. 4	Godey & Co	do	19 00
8	Robert Boyd	Cotton waste	7 50
8	Estate of Mary E. Godey		19 00
11	Pettit & Dripps	Bearing bars	31 12
12	Bartlett, Hayward & Co		364 26
29	T. E. Clarke	Repairs	20 00
1884.			
Jan. 3	Hayward & Hutchinson	Sheet lead	80
3	do	Bolts, &c	11 67
3	George Ryneal	Red lead, &c	12 95
22	Adam Weber	Fire brick	91 25
24	John Lyon	Covering pipe	8 00
Feb. 1	Clarke & Given	Coal and wood	919 55
9	do	Coal	326 80
9	Hayward & Hutchinson		13 95
Mar. 12	Bartlett, Hayward & Co	Coils, &c	695 38
July 21	Clarke & Given	Fuel	1,407 32
	Total		8,083 22

GAS.

1883.			
Aug. 6	W. H. Bailey	Care of lamps	$61 75
Sept. 7	do	do	62 35
14	Washington Gas Light Company		332 70
14	do		360 15
Oct. 8	W. H. Bailey	Gas and care of lamps	73 00
Nov. 1	do	do	75 55
Dec. 17	do	do	77 50
1884.			
Jan. 11	do	do	81 55
Feb. 11	do	do	76 60
Mar. 10	do	do	68 20

Expenditures under the appropriation for the contingent expenses of the Post-Office Department, &c.—Continued.

GAS—Continued.

Date.	To whom paid.	On what account.	Amount.
1884.			
Mar. 12	Washington Gas Light Company		$376 65
12	do		399 00
12	do		450 30
12	do		475 35
12	do		510 31
12	do		132 75
12	do		85 35
12	do		104 55
12	do		87 15
Apr. 14	W. H Bailey	Gas and care of lamps	72 25
May 10	do	do	67 60
Aug. 9	Washington Gas Light Company		444 45
9	do		386 72
9	do		91 65
9	do		433 80
9	do		435 60
9	do		460 81
9	do		105 45
9	do		93 45
12	Daniel Ryan	Gas and care of lamps	37 00
12	do	do	37 00
	Total		6, 556 54

PLUMBING AND GAS FIXTURES.

1883.			
Sept. 13	Hayward & Hutchinson		$8 20
Oct. 1	do		26 65
Dec. 12	Samuel S. Shedd	Chandeliers	33 60
12	do	do	43 15
1884.			
Jan. 3	Hayward & Hutchinson		23 68
3	do		141 66
3	George Ryneal, jr	White lead	73
5	Hayward & Hutchinson		99 31
5	do		53 95
12	S. H. Shedd		34 40
Feb. 9	Hayward & Hutchinson		91 85
Mar. 4	S. S. Shedd		54 55
20	Hayward & Hutchinson		57 86
Apr. 18	do		21 42
Sept. 10	do		22 05
10	do		184 43
	Total		896 49

TELEGRAPHING.

1883.			
Dec. 12	Western Union Telegraph Company		$378 27
12	do		309 92
12	do		384 69
1884.			
Jan. 28	do		387 54
28	do		512 43
28	do		433 84
Feb. 15	Baltimore and Ohio Telegraph Company		2 21
16	do		3 63
16	do		64
Mar. 29	do		1 05
Apr. 22	Western Union Telegraph Company		345 02
22	do		454 83
15	American Rapid Telegraph Company		75
Aug. 20	Western Union Telegraph Company		304 74
20	do		375 89
20	do		431 09
20	do		424 37
Sept. 18	Bankers' and Merchants' Telegraph Company		80
18	do		1 78
Oct. 24	Baltimore and Ohio Telegraph Company		3 99
	Total		4, 757 48

Expenditures under the appropriation for the contingent expenses of the Post-Office Department, &c.—Continued.

PAINTING.

Date.	To whom paid.	On what account.	Amount.
1883.			
Aug. 17	T. A. Brown	Painting	$414 44
17	S. S. Parker	Inspecting	29 01
Sept. 1	T. A. Brown	Painting	683 96
3	S. S. Parker	Inspecting	47 88
8	T. A. Brown	Painting	335 47
11	S. S. Parker	Inspecting	23 48
22	T. A. Brown	Painting	605 34
22	S. S. Parker	Inspecting	42 37
Oct. 6	T. A. Brown	Painting	426 47
9	S. S. Parker	Inspecting	29 85
20	T. A. Brown	Painting	409 21
24	S. S Parker	Inspecting	28 65
27	T. A. Brown	Painting	408 69
30	S. S. Parker	Inspecting	28 61
Nov. 17	T. A. Brown	Painting	234 85
20	S. S. Parker	Inspecting	16 44
Dec. 4	T. A. Brown	Painting	900 82
1884.			
Feb. 11	Armor & Co	Lettering	2 50
	Total		4,668 04

CARPETS.

1883.			
Aug. 21	W. B. Moses & Son		$345 61
21	do		5 90
Sept. 22	do		3 60
Oct. 1	L. Rice	Cleaning carpets	3 34
Nov. 1	Peterson & Childs		652 78
Dec. 10	do		1,820 80
28	do		157 58
1884.			
Feb. 2	do		16 50
Mar. 6	do		116 89
May 2	do		69 26
10	do		126 35
	Total		3,318 61

FURNITURE.

1883.			
July 14	J. B. Hammond		$177 75
16	V. Lammond	Caning chairs	27 00
26	W. B. Williams		225 50
26	G. M. Wight		115 00
28	J. B. Hammond		145 50
Aug. 6	S. J. Haislett	Awning-braid	3 00
6	C. Smith	Work on awnings	12 64
6	W. B. Moses & Son	Chairs, &c	552 50
6	do	do	354 00
10	W. B. Williams	Desks, &c	175 00
Sept. 6	J. B. Hammond	do	439 24
8	V. Lammond	Caning chairs	13 50
12	W. B. Williams	Desks, &c	222 00
13	Singleton & Hoeke	Holland	69 10
22	W. B. Moses & Son	Chairs, &c	126 50
22	Robert Boyd	Awning-cloth, &c	155 18
Oct. 20	G. M. Wight	Desks, &c	60 00
Nov. 10	J. B. Hammond	do	304 15
14	W. B. Williams	do	258 00
17	V. Lammond	Recaning	10 50
Dec. 4	J. B. Hammond	Cases	157 67
8	Robert Boyd	Chair-seats	12 00
28	W. B. Williams	Chairs, &c	75 50
1884.			
Apr. 4	V. Lammond	Recaning chairs	15 00
May 3	J. B. Hammond	Rollers, &c	7 26
10	W. B. Moses & Son	Desks, &c	541 25
26	W. B. Williams		33 50
	Total		5,249 52

Expenditures under the appropriation for the contingent expenses of the Post-Office Department, &c.—Continued.

KEEPING OF HORSES AND REPAIRING OF WAGONS.

Date.	To whom paid.	On what account.	Amount.
1883.			
Aug. 2	Lanahan & Co	Horseshoeing	$10 50
6	William Fisk	Horse-feed	40 84
Sept. 1	Lanahan & Horan	Horseshoeing	9 50
3	William Fisk	Horse-feed	44 56
10	John Coughlin	Medicine	3 55
Oct. 2	Lanahan & Horan	Shoeing	12 50
3	K. Kneessi	Harness repairing	27 50
5	William Fisk	Horse-feed	44 74
12	John McDermott & Bro		93 75
Nov. 2	Lanahan & Horan		7 75
7	William Fisk	Horse-feed	42 22
30	H. M. Clayton & Co	Concreting	15 00
Dec. 1	J. Lanahan	Horseshoeing	10 75
5	William Fisk	Horse-feed	42 80
1884.			
Jan. 2	J. Lanahan	Horseshoeing	17 00
3	K. Kneessi	Harness repairing	29 10
3	John McDermott & Bro		24 00
5	William Fisk	Horse-feed	43 32
5	Hayward & Hutchinson		19 65
Feb. 2	J. Lanahan	Horseshoeing	17 88
2	William Fisk	Horse-feed	46 23
9	Hayward & Hutchinson		9 30
Mar. 4	J. Lanahan	Horseshoeing	8 50
4	William Fisk	Horse-feed	46 23
Apr. 2	John McDermott & Bro	Repairs	13 20
2	J. Lanahan	Horseshoeing	14 00
3	William Fisk	Horse-feed	45 05
3	K. Kneessi & Son	Repairs	19 50
May 2	J. Lanahan	Horseshoeing	8 75
3	William Fisk	Horse-feed	45 17
24	John McDermott & Bro	Repairs	101 25
July 21	J. Coughlin	Medicine	2 05
21	K. Kneessi	Repairs	28 25
22	William Fisk	Horse-feed	44 45
22	....do	....do	52 81
23	J. Lanahan	Horseshoeing	13 75
23	....do	....do	10 50
	Total		1,065 90

HARDWARE.

1883.			
Aug. 10	Robert Boyd		$259 00
Sept. 22	....do		85 15
Oct. 18	....do		67 56
Nov. 7	....do		205 18
10	J. B. Hammond		7 75
21	Paret & Whittington		30 00
Dec. 4	Robert Boyd		108 61
4	T. A. Brown		19 19
8	Robert Boyd		16 50
1884.			
Jan. 12	....do		33 60
12	....do		13 70
Feb. 5	....do		99 85
5	....do		45 50
Mar. 13	....do		34 55
13	....do		7 20
Apr. 7	....do		158 53
7	....do		66 00
May 8	....do		63 50
July 21	....do		118 75
	Total		1,440 12

Expenditures under the appropriation for the contingent expenses of the Post-Office Department, &c.—Continued.

RENT.

Date.	To whom paid.	On what account.	Amount.
1883.			
Nov. 17	J. S. Morrill	Topographer's office	$500 00
Oct. 2	Hooe & Beverly	Money-order office	2,000 00
1884.			
Jan. 3	Hayward & Hutchinson	Topographer's office	250 00
Mar. 1	....do	....do	125 00
Feb. 1	....do	....do	125 00
Jan. 11	Hooe & Beverly	Money-order office	2,000 00
Apr. 2	Haywood & Hutchinson	Topographer's office	125 00
May 2	....do	do	125 00
Apr. 5	Hooe & Beverly	Money-order office	2,000 60
July 25	....do	....do	2,000 00
	Total		9,250 00

MISCELLANEOUS EXPENSES, TOPOGRAPHER'S OFFICE.

1883.			
Aug. 4	B. W. Reed's Sons	Flour	$2 20
Sept. 1	Adams Express Company		45 50
4	C. Roeser, jr	Expenses	70 25
5	G. A. Whitaker	Drawing materials	95 75
17	N. T. Metzger & Bro	Flour	2 10
13	J. Bien & Co	Maps	2,333 33
Oct. 12	M. Brodhead	Cotton	124 25
Nov. 6	J. B. Hammond	Moving	242 00
7	J. L. Smith	Map-rollers	55 20
13	Julius Bien & Co	Maps	2,333 33
13	Adams Express Company		2 60
Dec. 4	Robert Boyd	Hardware	32 90
4	M. Brodhead	Cotton	271 19
26	Julius Bien & Co	Maps	2,333 33
28	N. T. Metzger & Bro	Flour, &c	8 40
28	Adams Express Company		25
1884.			
Feb. 9	Adams Express Company		25
20	Julius Bien & Co	Maps	2,333 33
Mar. 5	M. Brodhead	Cotton	43 33
Apr. 19	Julius Bien & Co	Maps	2,333 33
Aug. 8	M. Brodhead	Cotton	278 59
8	H. L. Hinkle	Map-rollers	286 00
9	E. W. Bullinger	Monitor Guide	3 00
9	B. Westermann & Co	Atlas	2 50
9	National Railway Publishing Company	Guides	12 00
11	Woodward & Lothrop	Cotton	57 69
11	E. Morrison	Screw-eyes, &c	27 65
11	Robert Boyd	Glue, &c	7 05
12	Julius Bien & Co	Maps	3,383 35
21	The Railway Gazette	Subscription	4 20
Sept. 3	G. A. Whitaker		110 50
	Total		16,835 35

OFFICIAL POSTAL GUIDES.

1883.			
Sept. 13	Houghton, Mifflin & Co		$849 09
22	....do		850 92
Nov. 7	....do		853 10
1884.			
Jan. 10	....do		854 57
10	....do		853 09
Feb. 19	....do		16,470 00
Mar. 12	....do		858 66
Apr. 15	....do		860 81
May 5	....do		864 55
Aug. 9	....do		2,621 15
	Total		25,935 94

Expenditures under the appropriation for the contingent expenses of the Post-Office Department, &c.—Continued.

MISCELLANEOUS ITEMS.

Date.	To whom paid.	On what account.	Amount.
1883.			
July 16	J. J. Chapman	W. C. paper	$38 00
17	J. W. Sinclair		10 10
23	National Railway Publishing Company	Guides	10 36
26	J. L. Gink	Law Report	3 00
Aug. 1	H. B. Gordon	Repairs to elevator	38 36
3	W. W. Farr	Care of clocks	10 00
3	B. W. Reed's Sons	Brooms	4 25
3	M. Twiford	Washing	20 70
3	C. McKenna	do	18 15
3	P. Taylor	do	19 50
4	M. Adams	Hauling	6 00
7	D. Smith	Lumber	17 60
8	Paret & Whittington		12 00
11	Columbia Mutual Ice Company		105 08
23	John Coughlin	Soap, &c	17 76
Sept. 1	N. T. Metzger & Bro		80 06
1	W. W. Farr	Care of clocks	10 00
1	C. McKenna	Washing	14 85
1	P. Taylor	do	16 50
1	M. Twiford	do	13 20
7	Woodward & Lothrop	Towels	77 50
7	Franklin & Co	Thermometers	10 50
5	M. Adams	Hauling	3 00
13	National Railway Publishing Company		10 64
17	N. T Metzger & Bro	Soap	115 00
17	J. J. Chapman	W. C. paper	57 00
4	M. Brodhead	Cotton	10 62
24	Burns & Creecy	Concreting	285 00
25	C. G. Schneider	Safe	250 00
28	J. M. Judd	Cyclopædia	5 00
29	P. Taylor	Washing	15 30
29	W. W. Farr	Care of clocks	10 00
Oct. 1	K. Kneesi	Horse-covers	27 00
3	M. Twiford	Washing	13 95
3	C. McKenna	do	14 25
6	William Fry	Hauling	10 50
12	George C. Maynard	Electric bells	71 79
13	John Coughlin	Chamois, &c	18 00
16	Columbia Mutual Ice Company		226 94
20	T. W. Smith	Lumber	295 00
20	N. T. Metzger & Bro	Matches, &c	82 52
22	S. J. Haislett	Flag	36 00
23	Metropolitan Railroad Company	Tickets	60 00
23	C. Manuel		3 00
26	Adams Express Company		2 45
Nov. 1	W. W Farr	Work on clocks	10 00
2	L. B. Hill	Washing, &c	9 00
2	P. Taylor	do	18 30
2	Lanahan & Horan	Stays	1 00
3	C. McKenna	Washing	18 30
6	J. W. Boteler & Son	Pitcher, &c	65 35
7	Robert Boyd	Valvoline	73 50
Nov. 7	Paret & Whittington	Book	7 50
7	National Railway Publishing Company		15 68
9	J. W. Boteler & Son	Spittoons	16 40
10	H B Gordon		22 00
19	Columbia Mutual Ice Company		116 56
20	N. T Metzger & Bro		17 50
21	Paret & Whittington		87 50
27	T. A. Ladson	Repairing pitcher	3 00
30	M. Twiford	Washing	18 30
Dec. 4	C McKenna	do	15 60
4	T. A. Brown	Glass, &c	52 64
4	M. Twiford	Washing	15 45
4	P Taylor	do	14 70
4	W. W. Farr	Care of clocks	13 50
4	J. B. Hammond		98 65
4	A. Lindsay	Hauling	12 50
5	Chesapeake & Potomac Telephone Company		172 00
5	Wyckoff, Seamans & Benedict		110 25
6	C. Schneider	Repairing bells	45 00
7	T. A. Brown	Repairs	123 25
8	S. S. Parker	Inspection of repairs	82 14
14	M. Brodhead	Cotton	10 59
14	Metropolitan Railroad Company	Tickets	6 00
14	George Watts	Coolers, &c	55 65
19	Columbia Mutual Ice Company		87 28

Expenditures under the appropriation for the contingent expenses of the Post-Office Department, &c.—Continued.

MISCELLANEOUS ITEMS—Continued.

Date.	To whom paid.	On what account.	Amount.
1883.			
Dec. 26	J. B. Hammond	Hauling	$10 00
28	N. T. Metzger & Bro	Soap, &c	76 27
1884.			
Jan. 3	George Ryneal, jr	Sperm oil, &c	144 82
3	Mrs. P. Taylor	Washing	19 50
3	K. Kneesi	Horse covers	31 00
3	W. W. Farr	Care of clocks	10 00
5	Hayward & Hutchinson		18 05
5	A. Lindsay	Hauling	17 00
5	C. McKenna	Washing	20 40
7	Chesapeake and Potomac Telephone Company		247 00
7	M. Twiford	Washing	20 55
9	Metropolitan Railroad Company	Tickets	15 00
10	Washington Post		1 50
11	Columbia Mutual Ice Company		20 00
15	Hayward & Hutchinson		16 80
15	National Railway Publishing Company		2 50
15	Thomas W. Smith	Lumber	39 39
17	R. W. Mullan	Rent of safe	24 00
17	Mutual District Messenger Company		11 35
19	J. B. Adams	Directories	200 00
19	D. B. Canfield & Co	Law reporter	2 50
19	J. W. Sinclair	Elevator repairs	21 50
21	W. H. Porter & Co	Caligraph	110 00
22	National Railway Publishing Company		10 36
23	Metropolitan Railroad Company	Tickets	10 00
25	T. & J. W. Johnson & Co	Reports	3 50
25	National Railway Publishing Company		5 32
26	N. T. Metzger & Bro	Soap, &c	17 58
28	Metropolitan Railroad Company	Tickets	5 00
28	M. Brodhead	Towels	35 00
31	The Meaker Manufacturing Company		8 50
31	Armor & Co	Signs	19 00
31	Columbia Mutual Ice Company		84 28
Feb. 1	W. W. Farr	Care of clocks	10 00
1	P. Taylor	Washing	16 20
1	C. McKenna	do	16 80
2	A. Lindsay	Hauling	22 00
4	M. Twiford	Washing	18 30
5	John L. Gink	Report	6 50
5	T. A. Ladson	Rep. pitcher	2 75
11	J. B. Hammond	Cases, &c	27 75
11	L. B. Hill	Work on towels	4 50
13	Columbia Mutual Ice Company		108 16
16	N. T. Metzger & Bro	Matches, &c	17 50
18	D. H. Daneker	Expenses	1 00
25	Singleton & Hoeke	Curtains	139 31
25	Metropolitan Railroad Company	Tickets	15 00
27	P. Taylor	Washing	18 60
27	Fauth & Co	Rep. globes	21 75
Mar. 1	C. Schneider	Electric bells	20 00
1	C. McKenna	Washing	15 30
1	National Electric Company		15 50
1	W. W. Farr	Care of clocks	10 00
3	A. Lindsay	Hauling	20 75
3	M. Twiford	Washing	18 15
4	Metropolitan Railroad Company	Tickets	10 00
6	National Railway Publishing Company		10 64
7	Paret & Whittington		27 50
14	J. B. Hammond		7 00
15	H. B Gillingham		2 50
15	Columbia Mutual Ice Company		100 30
20	Hayward & Hutchinson		5 75
21	Adams Express Company		1 70
25	Otis Brothers & Co		30 00
29	N. T. Metzger & Bro		17 50
April 1	J. B. Hammond	Files	253 25
2	C. McKenna	Washing	20 40
2	W. W. Farr	Clocks	12 00
2	J. J. Chapman		93 00
3	K. Kneessi & Son	Horse-blankets	10 00
3	P. Taylor	Washing	21 60
3	A. Lindsay	Hauling	20 50
4	M. Twiford	Washing	21 90
5	Columbia Mutual Ice Company		108 16
5	Metropolitan Railroad Company	Tickets	10 00
5	Washington Post	Subscription	1 50

Expenditures under the appropriation for the contingent expenses of the Post-Office Department, &c.—Continued.

MISCELLANEOUS ITEMS—Continued.

Date.	To whom paid.	On what account.	Amount.
1884.			
Apr. 9	John Coughlin		$20 52
12	J. W. Sinclair	Repairs	23 00
15	Review Publishing Company	Law Review	5 00
15	National Railway Publishing Company	Guides	10 36
18	Hayward & Hutchinson		20 10
19	J. W. Boteler & Son	Tumblers, &c	32 50
24	C. Manuel	Halyards	3 00
26	S. J. Haislett	Braid	15 00
26	J. B. Hammond	Casing, &c	316 83
30	W. W. Farr	Care of clocks	12 00
May 1	Metropolitan Railway Company	Tickets	5 00
1	C. Smith	Work on awnings	12 50
2	N. T. Metzger & Bro		53 98
2	Otis Brothers & Co	Packing	8 40
2	C. McKenna	Washing	14 40
2	P. Taylor	do	17 55
3	A. Lindsay	Hauling	13 75
3	M. Twiford	Washing	18 15
6	Chesapeake and Potomac Telephone Company		206 20
10	Armor & Co	Signs	10 00
12	Metropolitan Railroad Company	Tickets	20 00
14	National Electric Company		34 95
10	W. B. Moses & Son	Storage	20 00
July 21	Samuel Lloyd	Sprinkling	100 00
21	George Watts & Son	Baskets	24 55
21	Robert Boyd	Waste, &c	55 13
21	Columbia Mutual Ice Company		328 90
21	A. Lindsay	Hauling	10 50
21	E. Jackson	Washing	19 05
21	P. Taylor	Washing	18 75
21	C. McKenna	do	14 70
21	E. Jackson	do	17 85
21	M. Twiford	do	9 90
21	N. T. Metzger & Bro	Matches	13 50
22	National Railway Publishing Company		10 64
22	N. T. Metzger & Bro		59 98
23	Wyckoff, Seamans & Benedict		2 00
24	W. W. Farr	Care of clocks	24 00
24	Towner, Landstreet & Co		115 30
24	J. W. Boteler & Son	Tumblers	23 50
21	P. Taylor	Washing	16 80
21	C. McKenna	do	16 95
21	A. Lindsay	Hauling	8 50
25	J. Q. Thompson	Advertisements	12 40
25	George Ryneal, jr		38 08
25	M. W. Beveridge		300 66
25	C. M. Bell	Crayons	75 00
26	Washington Post	Subscription	1 50
28	Metropolitan Railroad Company	Tickets	5 00
Aug. 1	National Electric Company	Repairs	17 85
1	The Sunday Herald	Advertisements	9 00
1	National Republican	Subscription	3 00
4	Washington Post Publishing Company		29 13
4	Chesapeake and Potomac Telephone Company		261 15
4	Adams Express Company		1 05
July 28	E. W. Woodruff	File-holders	28 80
Aug. 5	Otis Brothers& Co	Packing	9 75
5	T. & J. W. Johnson & Co	Report	3 50
12	J. S. Morrill	Repairs	200 00
12	George A. Shehan	Lumber	50 20
21	T. A. Ladson		2 00
21	R. W. Mullan	Rent of safe	12 00
25	J. B. Hammond	Hauling, &c	7 59
Sept. 3	C. Schneider	Repairing bells	*2 00
4	George C. Maynard	do	10 85
22	West Publishing Company	Report	10 00
Oct. 6	Chesapeake and Potomac Telephone Company		18 75
21	The Evening Star Newspaper Company		17 40
27	The National Republican	Soaps, &c	14 40
Nov. 19	M. W. Beveridge		6 90
25	Chesapeake and Potomac Telephone Company		37 50
	Total		9,169 46

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 36.

CHANGES IN SHORE LINE AT CALUMET, ILL.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

Report of Major Benyaurd, Corps of Engineers, relative to changes in the shore line of the harbor of Calumet, Ill.

DECEMBER 15, 1884.—Referred to the Committee on Rivers and Harbors and ordered to be printed.

WAR DEPARTMENT,
Washington City, December 13, 1884.

The Secretary of War has the honor to transmit to the House of Representatives, for the information of the Committee on Rivers and Harbors, a letter from the Chief of Engineers, dated the 10th instant, submitting a copy of a report of Maj. W. H. H. Benyaurd, Corps of Engineers, dated the 3d instant, in regard to the great advance of the shore line north of the harbor of Calumet, Ill., caused by the deposition of refuse matter, to the detriment of the interests of the United States, as connected with the improvement of that harbor.

ROBERT T. LINCOLN,
Secretary of War.

The SPEAKER *of the House of Representatives.*

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., December 10, 1884.

SIR: Referring to so much of section 2 of the river and harbor act of July 5, 1884, as directs the Secretary of War to "report to Congress

at its next session, all the instances in the United States in which piers, breakwaters, or other structures or works built or made by the United States in aid of commerce or navigation are used, occupied, or injured by a corporation or an individual, and the extent and mode of such use, occupation, or injury, and the facts touching the same," I have felt called upon to submit, in advance of the general report required by that section, the inclosed copy of a report dated December 3, 1884, from Maj. W. H. H. Benyaurd, Corps of Engineers, in regard to the great advance of the shore line north of the harbor of Calumet, Ill., caused by the deposition of refuse matter from the works of the North Chicago Rolling Mills, to the detriment of the interests of the United States as connected with the improvement of that harbor, and to recommend that it be transmitted to the Speaker of the House of Representatives for the information of the Committee on Rivers and Harbors, and such action as may be deemed advisable.

Very respectfully, your obedient servant,

JOHN NEWTON,
Chief of Engineers, Brigadier and Brevet Major General.

Hon. ROBERT T. LINCOLN,
Secretary of War.

ADVANCE OF THE SHORE LINE NORTH OF THE HARBOR AT CALUMET, ILLINOIS.

UNITED STATES ENGINEER OFFICE,
Chicago, Ill., December 3, 1884.

GENERAL: In the annual reports for the past two years upon the work of improving the harbor at Calumet, Ill., attention has been incidentally called to the advance of the shore line north of the harbor, caused by the deposition of slag and refuse matter from the works of the North Chicago Rolling Mills, and to the fact that if this deposition be not stopped, a farther extension of the north pier will be entailed upon the Government.

I transmit herewith a chart showing the shore lines north of the harbor from a date preceding the commencement of operations down to the present time. These shore lines are from surveys made under the direction of the different officers of the Corps, who have been in charge from time to time, by Mr. G. A. M. Liljencrantz, assistant engineer.

The first survey was made in October, 1869, and the last in July of the present year. In this interval the shore line has advanced, as measured along the north pier, a distance of 1,441 feet. It has been customary, as being the most convenient to indicate the changes in this shore line by its annual advance along said north pier. This, however, indicates the changes somewhat imperfectly, as, for example, in April, 1878, when the intersection of the shore line with the pier was found to be at the same point as in June of the previous year, though within a distance of 1,000 feet from the pier, the shore line had advanced somewhat, with an accretion inland of about 1½ acres.

To show as near as possible the actual amount of accretion from natural and artificial causes, the following table has been prepared:

MAP OF

CALUMET HARBOR ILL.

showing changes in

the shore line North of the entrance to the harbor

between October 9 th 1869 and the present date

JULY 1884

SCALE: 1 INCH = 200 FT.

100 50 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 1900 ft.

18' curve 1884

15 ft curve 1884

12 ft curve 1884

9 ft curve 1884

6 ft curve 1884

3 ft curve 1884

N. E. N.E. E. S.E. S.W. W. N.W.

Shore line Aug. 1883

Shore line June 1882

Shore line May 1881

Shore line June 1880

Shore line Apr. 1879

Shore line

Shore line Apr. 1878

Shore line

Filled 1871

Shore line Apr. 1876

Shore line July 1875

N. Limit of Mill Property

NORTH CHICAGO ROLLING MILL COMPANY'S WORKS.

West Limit of the Rolling Mill Co's Property

Original Shore line October 1869

Shore line Nov. 1871

ROLLING MILL CO'S SLIP

Shore line Apr. 1871

CALUMET HARBOR

Forwarded to
The Chief of Engineers U. S. Army
with letter dated U.S. Engineer Office
Chicago Ill. December 3d 1884.

(Signed) W. H. H. Benyaurd
Major of Engineers U.S.A.

H. EX. 36, 2, 48.

Date of survey.	Period of increase.		Areal increase.		Linear increase.	
	Years.	Months.	Amount since previous survey.	Monthly average.	Since previous survey.	Monthly average.
			Acres.	*Acres.*	*Feet.*	*Feet.*
October, 1869						
April, 1871	1	6	0.460	0.025	20	1.11
November, 1871		7	3.323	0 474	237	33.85
July, 1875	3	8	6.475	0.147	265	6.02
April, 1876		9	2.449	0.272	63	7.00
June, 1877	1	2	3.619	0.258	229	16.36
April, 1878		10	1.564	0.156	0	0.00
April, 1879	1		3.717	0.310	116	9.67
June, 1880	1	2	2.353	0.168	248	17.70
May, 1881		11	0.871	0.079	29	2.63
June, 1882	1	1	1.257	0.097	33	2.54
August, 1883	1	2	2.740	0.196	133	9.50
July, 1884		11	1.977	0.180	68	6.18
Totals	14	9	30.805		1,441	
Average per annum			2.089		97.7	
Average per month			0.174		8.14	

The amounts given represent only the changes within a distance of 1,000 feet from the north pier, but the regular advance of the shore line extends much further northward; according to the last survey, to about 2,300 feet beyond said limits. Therefore, in addition to the 30.805 acres already stated, there is a further increase of 29.04 acres, making a total of not less than 59.845 acres of land, all of which has been formed by the extension of the north pier, together with the deposits made by the Rolling Mill Company, and at the aggregate rate of about 4 acres per annum.

The extensive works of the company, consisting of furnaces, shops, and other large buildings, are located upon the land thus created, and in addition other improvements have been added. A slip 1,000 feet long and 100 feet wide has been constructed, connecting with the harbor about 100 feet east of the original shore line; the level of the ground has been raised from 6 to 8 feet above lake level, and numerous railroad tracks have been laid down, connecting the buildings one with another, and with outside railroad lines.

In the year 1878 to 1879 the company commenced to deposit, systematically, great quantities of slag and refuse from their mills, on the shore and in the lake along it, thereby artificially increasing the natural advance of the shore line. This was evidently done partly on purpose to form a solid shore protection, and at the same time dispose of otherwise useless material, but undoubtedly also for the sake of increasing the area of their property.

Experience in Chicago and other localities along the southwesterly coast of Lake Michigan suggests the assumption that the advance of the shore line, where a pier has been extended into the lake, is limited, and will cease in time, if subject to natural causes only. In Chicago, for example, the shore line north of the harbor entrance has, during several years past, remained practically unchanged, though for a number of years following the first work of pier construction the changes were quite large. It is therefore assumed that the same result would

in due time be found at Calumet Harbor, were the shore subject to natural causes only.

In each of these harbors the advance of the shore with simultaneous and proportionate decrease in depth of water farther out in the lake, has necessitated additional extensions from time to time to the respective north piers, but in Chicago such extension has not been required since 1876, when an addition of 600 feet was built, with its end reaching a depth of about 25 feet of water. The next previous extension of this pier was completed in 1869.

It is the intention at Calumet to maintain a depth of not less than 16 feet at the entrance of the harbor, and to that intent the north pier has been extended to its present length. It is believed that under ordinary circumstances the accretion from natural causes would have reached its limit by this time, and no farther extension of the harbor works would be required. The steady advance of the shore line, however, will continue so long as the rolling mills are allowed to continue their dumping operations with a consequent decreasing depth of water at the end of the pier. This will require additions to the work from time to time in order to maintain the required depth of 16 feet at the entrance and within the harbor.

I have deemed it necessary to bring the matter to the attention of the Department, in order that such steps as may be deemed necessary to protect the interests of the Government may be taken.

Very respectfully, your obedient servant,

W. H. H. BENYAURD,
Major of Engineers.

Brig. Gen. JOHN NEWTON,
Chief of Engineers, U. S. A.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 37.

ESTIMATES OF APPROPRIATIONS FOR SUPPORT OF CERTAIN INSTITUTIONS OF CHARITY.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

Additional estimates from the Commissioners of the District of Columbia of appropriations for the support of certain institutions of charity.

DECEMBER 16, 1884.—Referred to the Committee on Appropriations and ordered to be printed.

TREASURY DEPARTMENT,
December 15, 1884.

SIR: I have the honor to forward herewith additional estimates of appropriations received from the Commissioners of the District of Columbia for the support of the following institutions of charity, &c.:

For National Association for Relief of Destitute Colored Women and Children; Children's Hospital; Saint Ann's Infant Asylum, and Church Orphanage of the District of Columbia, $18,500.

For superintendent of charities, $2,000.

These amounts are respectfully submitted for the consideration of Congress, with the recommendation that Congress provide a separate amount for each institution of charity for which appropriation may be made.

The "Church Orphanage of the District of Columbia," specified in the above estimate, is believed to have been intended for the "Church Orphanage Association of Saint John's Parish of Washington, District of Columbia," and if appropriation be made, the association should be specified by its proper corporate name.

Very respectfully,

H. MCCULLOCH,
Secretary.

Hon. JOHN G. CARLISLE,
Speaker, House of Representatives.

OFFICE OF THE COMMISSIONERS,
DISTRICT OF COLUMBIA,
Washington, December 9, 1884.

SIR: The Commissioners have the honor to transmit through the honorable Secretary of the Treasury an estimate of appropriations necessary for the maintenance of certain institutions of charity in the Dis-

trict of Columbia, as required by the act making appropriations for the expenses of the District of Columbia, approved July 5, 1884 (omitted from annual estimate):

For the support of the following institutions of charity, viz: National Association for Relief of Destitute Colored Women and Children; Children's Hospital; Saint Ann's Infant Asylum, and Church Orphanage of the District of Columbia, $18,500; for one superintendent of charities, $2,000.

And all appropriations for the institutions of charity in the District (except for the Insane Asylum) made by this act shall be expended or withheld by the Commissioners at their discretion.

The Commissioners respectfully ask the attention of Congress to their views on these charities submitted in their annual report dated November 28, 1884.

Very respectfully,

J. B. EDMONDS,
President.

Hon. JOHN G. CARLISLE,
Speaker, House of Representatives, United States.

O

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 38.

DISBURSEMENT OF FUNDS FOR THE SUPPORT OF INDIAN SCHOOLS.

LETTER

FROM

THE SECRETARY OF THE INTERIOR,

TRANSMITTING

Report from the Commissioner of Indian Affairs, with inclosure, and recommending the removal of certain restrictions upon the disbursement of funds appropriated for the sapport of Indian schools.

DECEMBER 16, 1884.—Referred to the Committee on Appropriations and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, December 12, 1884.

SIR: I have the honor to present herewith copy of a report of 10th instant, with inclosure, noted therein, from the Commissioner of Indian Affairs, setting forth the embarrassment to the service growing out of the provision in the law requiring that the appropriation for the support of the Indian industrial school at Lawrence, Kans. ($60,000), shall be disbursed upon the basis of an allowance of not exceeding $175, for the support and education of each scholar (Pamph. Ed. U. S. Stat., Forty-eighth Congress, first session, page 92.)

This school has recently been opened. The first cost of equipping and fitting such a school for operation is much greater than will be required to maintain it after it is once properly inaugurated.

In view of the increased expenditures necessarily required at the opening of this school, the Commissioner submits an item, which he recommends be inserted in the Indian appropriation bill for the ensuing year, removing the restriction upon the appropriation designated as to the sum allowed to be expended for the support and education of each scholar for the current year.

As this will relieve present embarrassment and enable the Department to continue this school in successful operation without additional appropriation of money for the present fiscal year, I concur in the Commissioner's recommendation, and submit the matter to the favorable action of the Congress.

I will add, that a similar request was made in the cases of the Chilocco and Genoa Indian industrial schools regarding the appropriation made for the first year for said schools, and the matter was favorably

acted upon by the Congress, as will appear by the concluding portions of the clauses making appropriations for said schools (see Pamph. Ed. U. S. Stat., pp. 91 and 92).

The Commissioner of Indian Affairs further recommends, in the report herewith presented, that the restriction in the law establishing the Chilocco Indian industrial school in the Indian Territory (22 Stat., 85) which provides for the instruction therein in the English language and industrial pursuits of "the children of such of the Indian tribes located in the Indian Territory as are least provided for under existing treaties and laws" may be removed, so as to allow the pupils to be selected also from the various Indian agencies outside of the Indian Territory, and he states his reasons therefor as follows:

> It has been found that the proximity of this school to their homes tempts the children to run away whenever they happen to be homesick or dissatisfied.
>
> The discipline and value of this school would be promoted by adding pupils from other tribes to those from the Indian Territory.
>
> Moreover, thousands of children in New Mexico, Arizona, and other adjacent Territories are in sore need of school facilities.

The Commissioner submits draft of a clause amendatory of the law as recommended by him, and, concurring in his views, the matter is respectfully presented for the consideration of the Congress.

Very respectfully,

M. L. JOSLYN,
Acting Secretary.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, December 10, 1884.

SIR: I respectfully forward herewith communication of the 1st instant, from Superintendent Marvin, in which he refers to the impracticability of maintaining the Lawrence school during the current fiscal year on the allowance per pupil made by Congress, viz, one hundred and seventy-five dollars per annum. The school was not ready to open until the first of September. Pupils had to be obtained gradually, and it will be near the close of the fiscal year before the full quota of pupils can be obtained. Meantime furniture, clothing, implements, &c., for the whole number must be provided, and large expenditures must be and have been made for heating-apparatus, cisterns, and other permanent improvements, which necessarily make the cost of starting the school much greater than the mere cost of continuing it after it is fairly established and equipped.

I therefore respectfully recommend that Congress be asked, at its present session, to remove the restriction which limits the expenditure at the Lawrence school during the current fiscal year to a certain amount per pupil. Similar relief was given the Genoa and Chilocco schools last year, which was their first year.

The location of the Chilocco school "in the Indian Territory, adjacent to the southern boundary of the State of Kansas," was established by Congress in the Indian appropriation act of May 17, 1882, with the further provision that the pupils therein should be "children of * * * the Indian tribes located in the Indian Territory."

It has been found that the proximity of this school to their homes tempts the children to run away whenever they happen to be homesick or dissatisfied.

The discipline and value of the school would be promoted by adding pupils from other tribes to those from the Indian Territory.

Moreover thousands of children in New Mexico, Arizona, and other adjacent Territories are in sore need of school facilities.

I respectfully recommend that Congress be asked to remove the above-named restriction.

I inclose herewith paragraph embodying above recommendations, and recommend that it be inserted in the Indian appropriation bill for the next fiscal year.

Very respectfully, your obedient servant,

H. PRICE,
Commissioner.

The Hon. SECRETARY OF THE INTERIOR.

UNITED STATES INDIAN SERVICE,
INDIAN INDUSTRIAL SCHOOL,
Lawrence, Kans., December 1, 1884.

DEAR SIR: Our school opened on September 1 with fourteen pupils. We have increased that number as rapidly as possible, until at this writing our enrollment is two hundred and eighteen, with a fair prospect of three hundred by the 1st of January. On the 10th of July last the buildings were received from the contractor, but not in a condition for occupancy. The sinks, pumps, and other kitchen arrangements, the store-rooms, bath-rooms, drainage, and various similar necessaries required attention. These things, and the putting in of the heating apparatus, have all been done with as much speed and cheapness as practicable.

Many of the supplies purchased are of such a nature that they may be carried over into next year; such are all tools for blacksmith and carpenter shops, leather and iron stock for shoemaking and blacksmithing, much of the bedding and house-furnishing.

With the extra expenses unavoidable in opening a new institution, I do not see how it will be possible for me to come within the allowance of $175 per capita if the Treasury Department insists upon the ruling that the average attendance for the entire year shall be the basis of disbursement, unless at the close of this year I may receive credit for supplies to be carried over, and their value be deducted from this year's appropriation.

Further it seems to me that permanent improvements necessary to prepare the buildings for occupancy ought not to be counted as current expenses and taken from the allowance of $175 per pupil. One amount of $1,200, transmitted August 22, 1884, is charged to current support, 1885, but used for putting in heating apparatus. Another, received November 29, 1884, of $650, charged to the same account, is used for putting in a cistern to supply boiler-house. Other smaller expenditures are of the same nature. Cannot these expenditures be balanced by an appropriation from some other fund?

Respectfully,

JAMES MARVIN,
Superintendent.

Hon. H. PRICE,
Commissioner of Indian Affairs, Washington, D. C.

Paragraph to be inserted in act making appropriations for the Indian service for the year ending June 30, 1866, after the clause making appropriation for the support of the Indian School at Lawrence Kans.

And the limitation imposed upon the appropriation for this school for the fiscal year 1885 in the act approved July 4, 1884, is hereby repealed.

Paragraph to be inserted in act making appropriations for the Indian service for the year ending June 30, 1886, after the clause making appropriation for the support of the Indian School at Genoa, Nebr.

And children from any Indian tribes except the five civilized tribes in the Indian Territory may be admitted to this school.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 39.

SALARY FOR AN ADDITIONAL MESSENGER.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

An estimate from the Navy Department for salary of an additional messenger.

DECEMBER 17, 1884.—Referred to the Committee on Appropriations and ordered to be printed.

TREASURY DEPARTMENT,
December 16, 1884.

SIR: I have the honor to forward herewith, for the consideration of Congress, an estimate of appropriation received from the Secretary of the Navy for an additional messenger boy for his office, at a salary of $420 per annum.

Very respectfully,

H. MCCULLOCH,
Secretary.

Hon. JOHN G. CARLISLE,
Speaker, House of Representatives.

NAVY DEPARTMENT,
Washington, December 12, 1884.

Estimate for an additional messenger boy, for the fiscal year ending June 30, 1886, for service in the office of the Secretary of the Navy.

For one messenger boy at a salary of $420.

There are now allowed in the Secretary's office two messenger boys, one at $420, and the other at $240; one of them is employed in the office of the telegraphic operator, the other in the stationery division.

A third is required for the division of records and files, and will be capable of performing the principal part of the duties of an assistant messenger at a much lower rate of pay. The work of the division of records and files occupies several rooms which are widely separated, one being in the basement, another in the attic, and the others on the second floor.

Owing to the provisions of law which forbid the Department employing laborers or messengers and paying them out of the "contingent of the Navy," it is compelled, whenever special boards or courts are ordered to convene in the Navy Department, and which are almost constantly in session, to withdraw the regular labor and messenger force of the office for the purpose of attending such courts and boards. The labor and messenger force of the office of the Secretary of the Navy is insufficient to give that care and attention to the rooms and records which the interests of the public service actually require.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 40.

CONTRACTS FOR FEES TO CLAIM AGENTS IN PENSION CASES.

LETTER

FROM THE

ACTING SECRETARY OF THE INTERIOR,

TRANSMITTING,

In response to resolution of the House adopted December 12, 1884, *a letter from the Commissioner of Pensions relative to contracts for fees to claim agents in pension cases.*

DECEMBER 17, 1884.—Referred to the Committee on Payment of Pensions, Bounty, and Back Pay, and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, December 16, 1884.

SIR: In response to a resolution of the House of Representatives, dated the 12th instant, directing the Secretary of the Interior to report "the number of contracts providing for the payment of fees of twenty-five dollars in pension cases to claim agents under the act approved July 4, 1884, which have been filed in the Pension Office, and whether any of such contracts cover claims on file prior to the passage of said act, and also how many, if any, of such claims for fees have been allowed and paid, and if any fees so paid are for claims filed prior to the passage of said act," I have the honor to transmit herewith a copy of a letter from the Commissioner of Pensions, dated the 15th instant, containing the desired information.

Very respectfully,

M. L. JOSLYN,
Acting Secretary.

The SPEAKER *of the House of Representatives.*

DEPARTMENT OF THE INTERIOR, PENSION OFFICE,
Washington, D. C., December 15, 1884.

SIR: I have the honor to acknowledge your reference of a resolution of the House of Representatives, dated December 12, 1884, wherein you are directed to report to the House the number of contracts providing for the payment of fees of $25 in pension cases to claim agents under the act approved July 4, 1884, which have been filed in the Pension

Office, and whether any of such contracts cover claims on file prior to the passage of said act, and also how many, if any, of such claims for fees have been allowed and paid, and if any fees so paid are for claims filed prior to the passage of said act.

In reply to said inquiries, the following statement is respectfully submitted:

First. Under the provisions of the act of July 4, 1884, there have been filed in this office, up to and including December 12, the date of the resolution, 83,872 fee contracts, and the amount of fee stipulated, with comparatively few exceptions, is $25 in each case.

Second. Of the number of fee contracts filed (83,872), it is estimated that not less than 65,000 related to pension claims which were filed prior to July 4, 1884.

Third. Since July 4 last there have been allowed 10,764 original pension claims, all of which, with possibly less than a half dozen, were filed prior to the passage of the act named.

It is impracticable to ascertain within a reasonable period the exact number of fee agreements approved in the 10,764 claims allowed, but upon a careful examination the facts justify me in the belief that fee contracts have been approved in 65 per cent. of these claims, or, in round numbers, 7,000 contracts have been approved which related to claims on the files of the office prior to July 4, 1884.

I am, sir, very respectfully,

O. P. G. CLARKE,
Commissioner of Pensions.

Hon. H. M. TELLER, *Secretary of the Interior.*

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 41.

UNVEILING THE STATUE OF REAR-ADMIRAL SAMUEL FRANCIS DU PONT.

LETTER

FROM

THE SECRETARY OF WAR,

INFORMING

The House of the completion of arrangements for the unveiling of the statue of Rear-Admiral Samuel Francis Du Pont.

DECEMBER 17, 1884.—Referred to the Committee on the Library and ordered to be printed.

WAR DEPARTMENT,
Washington City, December 16, 1884.

The Secretary of War has the honor to report to Congress that the work of preparing the selected site, in the city of Washington, and the base for a statue of the late Rear-Admiral Samuel Francis Du Pont, of the United States Navy, as required by the act of Congress approved February 25, 1882, and the making and erection of the statue under the provisions of the act approved March 3, 1884, have been completed, and that the ceremonies attending the unveiling of the statue, contemplated by the act approved July 7, 1884, have been arranged to take place at 2 o'clock in the afternoon of Saturday, the 20th instant, at Du Pont Circle, provision having been made for the anticipated attendance of the Senate and the House of Representatives.

ROBERT T. LINCOLN,
Secretary of War.

The SPEAKER *of the House of Representatives.*

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. DOC. No. 42.

CAÑADA DE COCHITI LAND CLAIM.

LETTER

FROM THE

ACTING SECRETARY OF THE INTERIOR,

TRANSMITTING

The report of the surveyor-general of New Mexico on the New Mexico private land claim "Cañada de Cochiti," No. 135, in the name of Antonio Lucero.

DECEMBER 17, 1884.—Referred to the Committee on Private Land Claims.

DEPARTMENT OF THE INTERIOR,
Washington, December 16, 1884.

SIR: Pursuant to the requirement of the 8th section of the act of July 22, 1854 (10 Stat., 308), I have the honor to transmit herewith the report of the surveyor-general of New Mexico on the New Mexico private land claim "Cañada de Cochiti," No. 135, in the name of Antonio Lucero.

A copy of the letter of the Assistant Commissioner of the General Land Office, forwarding the report to me, is also herewith.

Very respectfully,

M. L. JOSLYN,
Acting Secretary.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., December 15, 1884.

SIR: I have the honor to forward herewith, to be transmitted to Congress for its action thereon, the report of the United States surveyor-general for New Mexico, in duplicate, in the case of the Cañada de Cochiti, the heirs and legal representatives of Antonio Lucero, claimants, being New Mexico private land claim No. 135.

Very respectfully, your obedient servant,

L. HARRISON,
Assistant Commissioner.

Hon. H. M. TEILER,
Secretary of the Interior.

CAÑADA DE COCHITI, No. 135. ANTONIO LUCERO.

UNITED STATES SURVEYOR-GENERAL'S OFFICE,
Santa Fé, New Mexico, Sept. 3rd, 1884.

I, Clarence Pullen, surveyor-general of the United States land office of New Mexico, do hereby certify the annexed copies of the following described papers are true and literal exemplifications from original papers on file in this office, viz:

No. 1. Petition of J. G. Whitney.
No. 2. Sketch map.
No. 3. Old muniments of title in Spanish.
Nos. 4, 5, and 6. Official translations.
No. 7. Amended petition of claimant.
No. 8. Letter from Fiske and Warren.
Nos. 9 and 10. Testimony of witnesses.
No. 11. Letter from Amado Chaves.
No. 12. Testimony of Florencio Sandoval.
No. 13. Opinion of Henry M. Atkinson, surveyor-general (printed).

In witness whereof I have hereunto subscribed my name, and caused the seal of this office to be affixed at the city of Santa Fé, on the day, month, and year above written.

[SEAL.]

CLARENCE PULLEN,
Surveyor General.

ANTONIO LUCERO.—CAÑADA DE COCHITI.

To the Hon. Henry M. Atkinson, United States surveyor-general for New Mexico:

Your petitioners, the heirs and legal representatives of Antonio Lucero, deceased, respectfully represent:

That they are the owners of a certain piece or parcel of land situate in the county of Bernalillo, in New Mexico, known as the "Cañada de Cochiti grant," which grant was made to the said Antonio Lucero by the Spanish Government on the 2nd day of August, 1728, and juridicial possession thereof given on the 6th day of August, 1728, as will more fully and clearly appear from the original grant and title papers now on file in your office.

A sworn translation in English of said original grant your petitioners file herewith and make a part of this petition, and also present as sketch-map of the tract of land claimed under said grant to said Antonio Lucero, deceased, which sketch-map represents the said tract as accurately as is practicable without a survey, no survey having ever been made.

Your petitioners further state that the said Antonio Lucero and his heirs and legal representatives have continuously occupied the said grant, cultivating land thereon, and pasturing their stock from the date of said grant up to the present time.

Your petitioners present said title papers for your consideration and approval under the provisions of an act of Congress, approved July 22nd, A. D. 1854, p. v, U. S. Statutes, and ask leave to present other documentary evidence and oral testimony in proof of their title.

JAMES G. WHITNEY,
For himself and other legal representatives of Antonio Lucero, deceased.

[ES COPIA.]

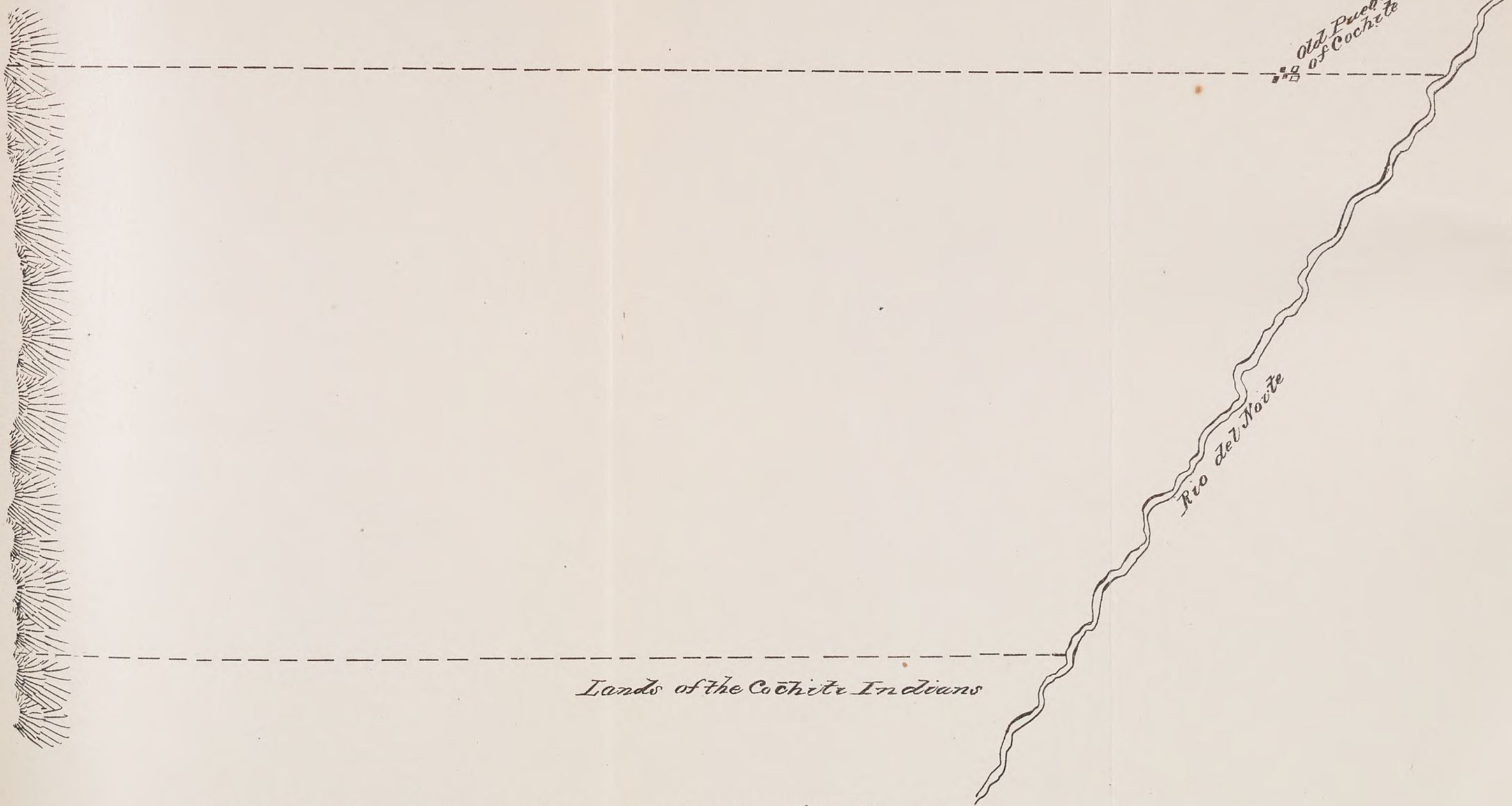
VILLA DE SANTA FEÉ.
y Ag^to 2d de 1728.

Ante el señor Governador y capitan Grãl de este Reyno de la nueba Mex^co se precento por el contenido.

Antonio Lucero vecino de la Villa de Alburqq^e ante la grandesa de V. S. paresco por aquella via y form a que el Derecho me concede; y digo que por cuanto me hayo casado y con familia y no tener donde vivir, ante V. S. registro un pedaso de tierra Realenga que se halla en la mesa de Cochiti donde estubieron retirados los Yndios que se sublevaron para en el sembrar y labrar end ho pedaso de tierra dies anegas de Trigo y dos de mais, y para pastear mi ganado menor y caballada, y linda dha tierra por la parte del norte con el Pueblo Viéjo de Cochiti, y por el Oriente con el Rio del Norte, y por el Sur con tierras de los naturales de dho Pueblo y por el Poniente con la sierra de Xemes con sus entradas y salidas abrevaderos usus y serbidumbres, y no siendo en perjuicio de tercero, se hade servir V. S. de aserme merced en nombre de su Majestad, por todo lo cual. A V. S. pido y suplico provea y mande como pido que recivire bien y merced, y juro por Dios nuestro señor no ser de malicia en lo nesesario, &ª.

ANTONIO LUCERO.

North



Sketch Map of the Cañada de Cochite Grant
Bernalillo Co. N. M.

H. EX. 42, 2, 48.

Y por su S. S. vista la hubo por precentada y Registrada la tierra que la parte pide para cuyo efecto manda y mandó al Alcalde Mayor de San Phelipe, Santo Domingo y Cochiti pase y reconosca dho. pedaso de tierra con citacion de los naturales de dho Bueblo y otros que aian imediatos, y haviendo cualesquier opocicion se suspenda; y no haviendo enbaraso y siendo siu perjuicio de tercero que mejor derecho tenga se le hace la Merced en nombre de su Majestad y le metera en posecion R^{l}. y personal de vajo de los linderos que cita de la cual habiendola adquirido quieta y pasificamente no sea desposeido y la gose el y sus Erederos con advertencia que la pueble detro del termino que disponen Reales ordenansas, y hasi lo Decretó mandó y firmó por ante mi el precente secretario de Governacion y Guerra doy fée, y dada dha. posecion de volvera el original para que sele de Testimonio.

BUSTAMANTE.

Por mano dado del sõr Governador y Capitan Grãl.

ANTON^{o} DE GRRUCIAGA,
Secretario de Governacion y Guerra.

En este Puesto de la Cañada de nuestra señora de Guadalupe, en seis dias del mes de Agosto del año de mil setecientos veinte y ocho, Yo el Alcalde mayor del Pueblo de Cochiti, Santo Domingo y San Phelipe le di posecion en nombre de su Majestad, de las tierras que en esta Merced se dicen y moncionan al interesado, y haviendolas registrado, tome á Anton^{o} Lucero de la mano y lo pasie por dha tierra en señal de Lexitima posecion, y no haviendo persona alguna que por mejor derecho la demandase la di por buena y en señal de verdad ago mi firma a costumbrada, ante los testigos de mi asistencia.

EL CAPITAN ANDRES MONTOYA.

Arruego de Josef Santiestevan.

ANDRES MONTOYA.

Es copia cierta fiel y Legal de los Documentos de merced que se refieren, los que por estar truncos y mui maltratados se ha sacado esta copia con vastante trabajo ante los testigos de mi asistencia quienes la bieron sacar corregir y en mendar de los instrumentos originales para que en todo tiempo conste precentados ante mi D. Juan Antonio Cavesa de Baca Alcalde maior de Cochiti y su Juris^{n} autorisandolos en devida forma en treinta dias del mes de Dbre del año de mil ochocientos dies y siete, y en Testimonio de verdad la firmé con los testigos como dho es de que doy fée.

JUAN ANTTO CABESA DE BACA. [Rubric.]

A^{sia}

JUAN ESTEVAN ARRAGON. [Rubric.]

A^{sia}

JUAN GONSALES. [Rubric.]

A^{sia}

SEBASTIAN SALAS. [Rubric.]

Asistencia LUIS M^{a} CABESA DE BACA.

Ante mi D^{n} Juan Antoni Cabesa de Baca alcalde mayor de esta Juridicion de Cochiti y los testigos de mi asistencia ceden el mismo derecho q^{e} los legitimos crederos de esta merce en cuantos bivientes hayga en dho citio por aber contribuido todos en comun apagar el yporto de derechos de esta merse y para en todo tiempo coste lo firme como dho. es de que doy fe.

JUAN ANTTO CABESA DE BACA. [Rubric.]

A^{sia}

JUAN ESTEVAN ARAGON. [Rubric.]

A^{sia}

JUAN GONSALES. [Rubric.]

A^{sia}

SEBASTIA SALAS. [Rubric.]

Señor Alce. mor. Cappn. á Gera. Dn Antonio de Armenta.

Antonio Luzero de Godoi, Jose Antonio Luzero, Mig^{l} Luzero, Ynasio Luzero, Fran^{co} Luzero, Loreto Luzero, Xabier Luzero, Antonio Jose Labato, Ramon Gallego. Cayetano Montaño, Bernabe Gallego, Juan Epomuseno Luzero, Oriundos de este Reino Besinos y erederos atualesdel puesto de Nuestra Señora de Guadalupe Juridision de la Cañada de Cochiti ante Vmd. paresemos en la mejor forma que alla lugar y al nuestro con benga y de simos Señor por lo que cenos ase patente de nuestras tieras y dominios Catolicos ael fin ultimo que Nuestro then^{te} ce nos biene entrando en asernos en nuestras tieras y dominios una ceparasion para el fin de pastar en ello la corta cabalgadura que tenemos para el Real servicio de S. mag^{d} á quien Dios G^{e}y

mallor ceguridad á lo que desimos señor que ese favor de Nuestro Sn thente nos es mui doloroso—á dho. fabor y bien que nos progura no somos con de sendidos por que Nuestros padres y abuelos nos de Xaron dho. sitio ygualmente a todos para que con la bendision de Ds y la de sus mersedes lo gosaramos todos sin que ninguno fuese pribado de ninguna asion con lo que a cada uno Dios fuera serbido darle.

Y por tanto á Vmd pedimos y suplicamos con el Mar Rendimiento de Nuestra obligacion ce sirba en determinar lo que allare en Justisia nos conbenga que en aserlo Recebiremos de Vmd gran merce y Justisia que pedimos y Juramo en debida forma de Dro. per Dios N. S. y la señal de la Sta Cruz no ser de malisia este nuestro pedimento y en lo nesesario & A. A ruego de todos los espresados.

CAYETANO MONTAÑO. [Rubric.]

En bista del escrito resentado por los herederos del difunto Anto Luzero en que me hasen patente el agrabio que se les hase en querer que el parage que llaman de la Cañada de en medio se quede solamente reserbado para Cavallerias por el pedimento ô suplica que hiso Antonio Gallego vecino de la expresada Cañada de Cochiti al Señor Coronel de Cavalleria Govor Politico y Militar Dn Juan Bapta de Anza digo que abiendo yo el nominado Alce Mayor y Capitan â Guerra Dn Antonio de Armenta dado parte á mi superior Gefe delo presentado por dhos. mensunados herederos me respondio su Señoria que una vez que se pone el comun de sus convecinos que gozen los expresados herederos de aquello que tan legitimamente es suio, pues deben ser perferidos a todo particular y mas quando por todas bias son los legitimos acredores a dicho sitio y era haserles un agrabio bien doloso imas quando estos tienen sus Ganados y mañana ú otro dia pueden pastarlos en el dhô. sitio como suio que es iquererselos impedir dho. Gallego con elpretesto de estar reserbado para solo Cavallerias porlo que no les acomodo dhâ propuesta y ôcurieron ami como su Alcalde Mayor para que si era Justo y si lo allaba por conbeniente el que se quedara para el fin que espone dicho Gallego les respondo que mas derecho les biene aellos por motibo de ser ellos los mas âcredores por todos motibos que no un Indibiduo que por solo favor se le abia dado lisencia para que criara unas pocas de obejas idehai queria llamar lo suio, sin tener ningun titulo ô documento que pudiera acreditarlo ser suio por lo qual ipor la facultad que me es conferida les doi el presente instrumento para que en qualquier tribunal ô Juez que sea presentado sean oydos en Juzticia por el drô. que desde sus abuelos y Padres adquirieron por merced Real (que S. M. Dios le guarde) les hiso a dhos. sus a Buelos y para que asi conste en todo tiempo di el presente instrumento firmado de mi Mano y con los infraescriptos testigos de mi asistencia en este Pueblo de San Buenaventura de Cochiti en dos dias del mes de Nobiembre de mil setecientos ochenta i cinco años a falta de escribano Pubco ni real que de ninguna clase los hai en toda esta Governacion doi Fee.

ANTONIO DE ARMENTA. [Rubric.]
to JOSE DE ARMENTA. [Rubric.]

tto Simon de Armenta. [Rubric.]

Villa de Santa Fee,
Y Agosto 2 de 1728.

Ante el S Governador Y capn General deste Reino de la Nueva Mexico se presento por el conthenido.

Antto Lusero * * * querque ante * * * resco por aqi * * * quel derech * * * por quanto * * * familia i no * * * ante Vssa * * * so de tierra * * * en la mesa de Cochiti donde estubieron Retirados los indios que se sublevaron para en el senbrar i labrar en dicho pedaso de tierra dies anegas de trigo y dos de mais i para pastar sus ganado menor y caballada, i linda dha tierra por la parte del norte con el Pueblo viejo de Cochiti, y por el oriente con el Rio del Norte y por el Sur con tierras de los naturales de dicho pue * * * r el poniente con * * * de Xemes con sus * * * salidas abreva * * * y serbidunbres * * * do en perjuicio de * * * de serbir Vssa de * * * terced en nombre * * * gestad por todo * * * lico provea i man * * * do que Resevire * * * rsed y juro dor Dios nuestro Sr. no ser de malisia en lo nesesario &a.

ANTTO. LUSERO.

Y por Su ssa bista la hubo por presentada i Rejis * * * la tierra que la parte pide pa quio efecto manda * * * do Al Alcalde maior de San Phelipe Santo Don * * * y Cochiti pase i rreconosca dhope daso de tierra co * * * tasion de los naturales de dho Pueblo Y otros que ai * * * ynmediatos i aviendo qualquier oposision ses * * * penda; Y no abiendo enbaraso isiendo sinperju * * * de tersero que mejor drecho tenga sele ase * * * Mersed en nonbre de su Magd i le metera e * * * posesion R Y personal debajo de los * * * ros que sita de la qual abiendo la adque. * * *

I, Antonio Lucero, a citizen of the village of Alburquerque, appear before the highness of your excellency through that channel and form which the law concedes to me, and state, that whereas I am married and have a family, and having no place to live, I register before your excellency a piece of land, royal domain, which is situated upon the mesa of Cochiti, to which the Indians who rebelled retreated to plant thereon, and on said piece of land to cultivate ten fanegas of wheat and two of corn, and to pasture my small stock and horse herd, and said land, is bounded on the north side by the old pueblo of Cochiti, and on the east by the Del Norte River, and on the south by lands of the natives of said pueblo, and on the west by the Jemez Mountain, with its entrances and exits, watering places, uses, and customs, and it not being in prejudice of any third party your excellency will please to make to me a grant in the name of His Majesty. In consideration of all which I ask and pray that your excellency provide and order as I request, whereby I will receive benefit and grace, and I declare by God our Lord that this is not in dissimulation and as is necessary, &c,

ANTONIO LUCERO.

VILLAGE OF SANTA FÉ,
August 2, 1728.

This petition was presented by the party therein before his excellency the governor and captain general of this kingdom of New Mexico.

And the same being examined by his excellency he treated the same as presented, and the land which the party applies for being registered he, for that reason, does direct, and did direct, that the chief alcalde of San Felipe, Santo Domingo, and Cochiti, go and examine said piece of land, citing the natives of said pueblos and others who may live adjoining, and there being any opposition to cease, and there being no obstacle, and it being without prejudice to any third party having a better right, the grant is made to him in the name of his majesty, and he will be placed in royal and personal possession under the boundaries he refers to, and of which, having acquired the same quietly and peaceably, he shall not be dispossessed, and he and his heirs may enjoy the same, with the charge that he shall settle the same within the time the royal ordinances prescribe. And he thus provided, commanded, and signed before me, the present secretary of state and war, to which I certify, and said possession being given he will return the original so as to furnish him a duplicate.

BUSTAMANTE.

By command of his excellency the governor and captain general.

ANTONIO DE GUICIAGA,
Secretary of State and War.

At this place of the Cañada of our Lady of Guadalupe, on the sixth day of the month of August, in the year one thousand seven hundred and twenty-eight, I, the chief alcalde of the pueblos of Cochiti, Santo Domingo, and San Felipe, did give unto him, the party interested, in the name of his majesty, possession of the lands expressed and mentioned in this grant, and having registered the same, I took Antonio Lucero by the hand and conducted him over said land in sign of lawful possession, and there being no person whatever who, under a better right, might claim the same, I deemed it good, and in sign of the fact I make my customary signature before my attending witnesses.

CAPTAIN ANDRES MONTOYA.

At the request of José Santiestevan.

ANDRES MONTOYA.

It is a true, faithful, and legal copy of the documents of grant to which they refer, of which, as they are incomplete and very badly treated, this copy has been made with great labor before the witnesses of my attendance who saw it made, corrected, and amended from the original instruments, so that it may in all time so appear, and which were produced before me, Juan Antonio Cabesa de Baca, chief alcalde of Cochiti and its jurisdiction, I authenticating the same in due form on the 30th day of the month of December, in the year eighteen hundred and seventeen, and in testimony of the fact I sign the same with the witnesses aforesaid, to which I certify.

JUAN ANTONIO CABESA DE BACA.

Attending, JUAN ESTEVAN ARAGON.
Attending, JUAN GONZALES.
Attending, SEBASTIAN SALAS.
Attending, LUIS MA CABESA DE BACA.

Before me, Juan Antonio Cabesa de Baca, chief alcalde of this jurisdiction of Cochiti, and the witnesses of my attendance do cede the same right which the legiti-

mate heirs of this grant to all there may be living upon said tract, they having contributed all in common to paying the amount of fees for this grant, and that it may so appear in all time I signed this as aforesaid, to which I certify.

JUAN ANTONIO CABESA DE BACA.

Attending, JUAN ESTEVAN ARAGON.
Attending, JUAN GONZALES.
Attending, SEBASTIAN SALAS.

SURVEYOR-GENERAL'S OFFICE,
Santa Fé, New Mexico, May 13, 1881.

The foregoing is a correct translation made by me from the original in Spanish on file in this office in private-land claim file number 95, in the name of Antonio Lucero.

DAV. J. MILLER,
Translator.

His honor the Chief Alcalde and War Captain, Antonio de Armenta :

We, Antonio Luzero de Godoi, José Antonio Luzero, Miguel Luzero, Ygnacio Luzero, Francisco Luzero, Loreto Luzero, Xabier Luzero, Antonio José Lobato, Ramon Gallegos, Cayetano Montaño, Bernabe Gallego, Juan Epomuseno Luzero, natives of this kingdom, actual residents and heirs of the place of our Lady of Guadalupe, jurisdiction of the Cañada de Cochiti, appear before you in the best form having place and to ours proper and state. Sir, as it is patent concerning our lands and Catholic possessions as a final resort that our lieutenant is coming upon us by making a separation among us upon our lands and possessions, with the purpose of pasturing thereon the few cavalry we have for the royal service of his majesty, whom may God preserve, and for better protection, concerning which we declare, sir, that that favor of our lieutenant is very grievious. So that favor and benefit which he attempts for us we are not consented, for our fathers and grandfathers left the said tract to us equally to all, so that with the blessing of God and that of themselves we might all enjoy the same without any one being deprived of any right, which God may be pleased to grant to every one.

And therefore we ask and pray with the greatest submission to our duty that you be pleased to determine what you shall find is in justice due to us, for by so doing we will receive from you great grace and justice, which we seek; and we declare in due form of law by God our Lord, and the sign of the Holy Cross, that this our petition is not in dissimulation and as is necessary, &c.

At the request of all the aforesaid.

CAYETANO MONTAÑO.

In view of the petition presented by the heirs of the deceased, Antonio Luzero, in which they make patent to me the injury which is done them in desiring that the Cañada de en Medio, so called, remain reserved solely for cavalry, upon the petition or request which Antonio Gallego, a resident of the said Cañada of Cochiti, made to Don Juan Bantista de Anza, colonel of cavalry, civil and military governor, I state that, I, Antonio de Armenta, the said chief alcade and war captain, having made report to my superior chief of what was presented by the said mentioned heirs his excellency answered me that any time that the community of their neighbors objected that the said heirs should enjoy what is so lawfully their own, for they should be preferred to every individual, and furthermore, when they are in all respects the legal heirs to said tract, it was doing them a harm very grievous; and, also, when these have their stock, and to-morrow or any other day may pasture them upon said tract, as their own, which it is, and said Gallego wanting to prevent them under the pretext that it is reserved for cavalry only. Wherefore they did not accede to that proposition and they came to me as their chief alcalde to know if it was just or if I found it to be proper that it should remain for the purpose that said Gallego states, I answer that more right attaches to them, for the reason of their being in all respects more entitled than an individual to whom, by favor, only had been given permission that he might raise a few sheep, and hence wanted to call it his own, without having any title or document which might accredit its being his; wherefore and under the authority which is on me conferred, I give them the present instrument, so that before any tribunal or judge it shall be presented they may be heard in justice, with the right which since their grandfathers and fathers, they acquired by royal grant, which his majesty (God preserve him) made to the aforesaid, their grandfathers.

And that it may so appear in all time I give the present instrument, signed with my hand and with the undersigned witnesses of my attendance, at this pueblo of San

Buenaventura de Cochiti, on the second day of month November, year one thousand seven hundred and eighty-five, for want of a public or ooyal notary, as there is none of any kind in all this jurisdiction, I certify.

ANTONIO DE ARMENTA.

Witness:
JOSÉ DE ARMENTA.
Witness:
SIMON DE ARMENTA.

SURVEYOR-GENERAL'S OFFICE,
Santa Fé, New Mexico, May 13, 1881.

The foregoing is a correct translation made by me from the original in Spanish on file in this office in private land-claim file number 95, in the name of Antonio Lucero.

DAVE J. MILLER,
Translator.

[Translation.]

ANTONIO LUCERO—CAÑADA DE COCHITI GRANT.

I, Antonio Lucero * * * querque before * * * appear through that * * * which the law * * * whereas * * * family and not * * * before your excellency * * * cel of land * * * upon the mesa of Cochiti, to where the Indians who rebelled retreated to plant thereon, and the said piece of land will contain about ten fanegas of of wheat and two of corn, and to pasture my sheep and horse herd; and the said land is bounded on the north side by the old pueblo of Cochiti, and on the east by the Del Norte River, and on the south by the lands of the natives of said pue * * * the west with * * * of Jamez with its * * * exits watering * * * and rights of way * * * ing in prejudice of * * * your excellency will be pleased to * * * grant in the name * * * jesty for all * * * quest provide and ord * * * for I will receive * * * grace; and I declare by God our Lord that this is not in dissimulation, and as is necessary, &c.

ANTONIO LUSERO.

VILLAGE OF SANTA FÉ, *August* 2, 1728.

This petition was presented by the party therein before his excellency the governor and captain-general of this Kingdom of New Mexico.

And the same being examined by his excellency he treated the same as presented and regis * * * the land which the party asks, and for which purpose he ordered * * * ed that the chief alcalde of San Felipe Santo Dom * * * and Cochiti to proceed and examine said piece of land by * * * tation of the natives of said pueblos and others who may live near, and there being any oposition to suspend and there being no impediment, and it being without prejudice to a third party having a better right the grant is made to him in the name of His Majesty, and he will be placed in royal and personal possession under the boundaries he refers to, and of which having acquired it * * *

SURVEYOR-GENERAL'S OFFICE,
Santa Fé, New Mexico, August 15, 1882.

The foregoing translation was made by me from the original in Spanish now on file in this office in private land-claim No. 95, in the name of Antonio Lucero, and is correct.

DAV. J. MILLER,
Translator.

To Hon. H. M. ATKINSON,
U. S. Surveyor-General, New Mexico:

Your petitioners, the legal representatives of Antonio Lucero, respectfully represent that prior to the second day of August, A. D. 1728, said Lucero, in due form, petitioned the proper Spanish authorities in New Mexico to grant to him the tract of land called the Cañada de Cochiti, with boundaries—on the north, the old pueblo of Cochiti; on the east, the Rio del Norte; on the south, the lands of the natives of said pueblo; and on the west by the Jemes Mountains. That on the second of August, A. D. 1728, the said tract of land was granted to said Antonio Lucero by Bustamente, then governor and captain-general of New Mexico under Spain; that, thereafter, on the sixth day of August, A. D. 1728, juridical possession of said Cañada de Cochiti was given to said Antonio Lucero, with the boundaries aforesaid, by Andres Montoya, then chief alcalde of the pueblo of Cochiti, Santa Domindo, and San Felipe; that by virtue

of these proceedings, said Antonio Lucero acquired, under the laws, usages, and customs then in force in this Territory, a perfect title to all the land within the boundaries aforesaid; that the present claimants are James G. Whitney and J. P. Whitney; that said grant is situated in the county of Bernalillo, in the Territory of New Mexico; that said grant has never been surveyed, and your petitioners are therefore unable to state the quantity of land claimed further than that they claim under said grant all the land within the boundaries therein described; that no survey having been made of said Cañada de Cochiti grant, your petitioners are unable to state what conflicts, if any, there may be between the boundaries of said grant and those of other grants of land made by Spain or Mexico, but your petitioners believe that there is no valid conflicting claim on the part of any grant to any portion of said grant to Antonio Lucero.

To establish the validity of said grant your petitioners refer to the title papers of said grant, on file in your office, and to such of the documents, also on file in your office, as were executed or signed by the Spanish officials whose names appear on such title papers. Your petitioners also refer to the laws, orders, and decrees of the Spanish Government and officials in force at the date of said grant as the same appear in White's Recopolascion, and on file in the Spanish archives in the possession of the Government of the U. S. at Santa Fé, New Mexico; to the usages and customs then in force in New Mexico, and to such further documentary evidence and the testimony of such witnesses as they shall hereafter present to you.

Upon satisfactory proof of the validity of the Cañada de Cochiti grant, we respectfully ask it may be approved by you and transmitted to the Congress of the U. S. for confirmation.

Respectfully,

FISKE & WARREN,
Att'ys for J. P. and J. G. Whitney, Claimants.

SANTA FÉ, *June 2nd*, 1883.

Hon. H. M. ATKINSON,
Sur. Gen'l of N. M., Santa Fé, N. M.:

SIR: As attorneys for Mr. James G. Whitney *et al.*, owners of the Cañada de Cochiti grant in N. M., now pending for recommendation under the the act of 1854, before you, we respectfully ask that the testimony of Florencio Sandoval a witness for contestants in the matter of boundaries of said grant, be stricken from the record, because no opportunity to cross-examine said witness has been afforded Mr. Whitney and other owners of said grant or their attorneys.

Respectfully,

FISKE & WARREN,
Att'ys for James G. Whitney et al., owners of the Cañada de Cochiti grant

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In the matter of the investigation of the Cañada de Cochiti grant, being file number 95, held at the office of the United States surveyor-general, this 21st day of July, 1882.

There were present H. M. Atkinson, surveyor-general, Ireneo L. Chaves, sworn as special interpreter, and J. G. Whitney, claimant, with E. A. Fiske, his attorney.

FELIPE SANDOVAL, having been first duly sworn, deposeth and saith:

Question. State your name, age, occupation and place of residence.—Answer. My name is Felipe Sandoval; age fifty-four years; am a farmer and justice of the peace at Peña Blanca, and live at Peña Blanca, in Bernalillo County, Territory of New Mexico.

Q. How long have you resided there?—A. Since 1849; during that time I have been absent 8 years.

Q. Are you acquainted with a grant known as the Cañada de Cochiti; if so how long have you known it and where is it situate?—A. Yes I am; I have known it since 1866 or 1867; am not positive of the date. It is situated in the Cañada de Cochiti, in Bernalillo County, Territory of New Mexico.

Q. How do you know of the existence of such a grant?—A. Because I brought the original papers to the surveyor-general's office, as a commissioner for the grantees.

By Mr. FISKE:

Q. The original grant papers were shown the witness and asked if these were the original grant papers deposited by him with the surveyor-general.—A. Yes.

Q. From whom did you obtain the papers?—A. I obtained them from the people, I having been appointed a commissioner by the people residing on the grant.

Q. How long have these papers been in possession of the people who reside on the grant?—A. To my knowledge they have had possession of these papers since 1849.

Q. Are you acquainted with the general reputation among the people residing on this grant or vicinity, as to the time the grant papers have been in possession of the grant owners?—A. Yes.

Q. What is that reputation with reference to the time these papers have been in the possession of the owners?—A. The grant is generally understood to be over a century old from the time it was given. They had it in their possession.

Q. There was a copy of these grant papers made on the 30 of Dec., 1817, certified to by one Antonio Cabeza de Baca; state whether or not that copy was also deposited by you with the surveyor-general.—A. I don't remember whether I brought said copy or no.

Q. Do you remember what papers you brought to the office of the Surveyor-General at the time mentioned?—A. I do.

Q. (Witness now shown a paper purporting to be a certified copy of the grant, certified by one Antonio Cabeza de Baca, on the 30 day of December, 1817, and he was asked) is that one of the papers you deposited with the surveyor-general at the time and in the manner above mentioned?—A. Yes.

Q. Where did you get that certified copy?—A. It was given to me by the people as a commissioner to present it to the surveyor-general.

Q. When did you first see this certified copy?—A. I saw the certified copy at the same time I saw the other grant papers in 1849.

Q. Is there any general reputation among the people residing on the grant or vicinity as to the time this certified copy has been in the possession of the grant owners?—A. Yes.

Q. What is that general reputation as to the length of time this certified copy has been in the possession of the owners?—A. It is generally reputed to be in their possession since it was made.

Q. Did you know one Antonio C. de Baca, who made this copy?—A. I did not know him.

Q. Do you know when he died?—A. Do not know. I did not know him.

Q. How long have the owners of that grant been in possession of it, so far as you know?—A. Since the year 1849. I lived in Santa Fé prior to that time. In 1849 I went to said place to get married. I then saw the place for the first time.

By SURVEYOR-GENERAL:

Q. You state that the papers in this case you obtained from the owners of the grant to bring here and file; from whom did you obtain them?—A. I obtained said papers from Manuel Lucero, José Juan Lucero, Martin Lucero, Tellesforo Lucero, Francisco Lucero, José Ma. Lucero, José Antonio Sandoval, Juan Teodoro Lucero. The papers were handed me by Francisco Lucero.

Q. Did you read the papers at that time, or any other?—A. I read the copy, and a few words of the original.

Q. What was the purport of the copy?—A. It was a copy of the original grant, the original being torn and hard to read.

Q. When you was there in 1849 did you see any grant papers at that time?—A. Yes.

Q. What were the circumstances under which you saw them?—A. My father-in-law had the papers, and he showed them to me.

Q. Who was your father-in-law?—A. Antonio Serafin Lucero.

Q. Was he one of the owners of the grant?—A. He was one of the heirs of the grant.

Q. What relation was he to the grantee?—A. He was great-great-grandchild of the grantee.

Q. Then you and your wife inherited a portion of this property?—A. Yes.

Q. You are, therefore, an interested party to the investigation?—A. My wife had an interest in the grant, and sold it.

Q. When you sold, what was the nature of the deed that you made to the party purchasing, was it quitclaim or a warranty deed?—A. I sold my part of the grant, thinking the title to same was all right.

Q. Here was shown the witness a deed in Spanish, containing a covenant of a general guaranty, and he was asked if it is a similar deed to that executed by himself and wife to the purchaser of his wife's interest.—A. It was.

Q. Are you certain that the papers shown you this morning, the Spanish documents, are the same that you delivered here for the grant owners?—A. Yes, they are the same.

Q. How do you know they are the same?—A. Because I had them in my hand now, and had them before.

Q. I want to know how you know; do you know from any mark on the papers, or from reading them?—A. Because when I saw the papers before they had the names of

Juan Antonio C. de Baca, Juan Armijo, Esteban Aragon, and the paper contains the same names now.

Q. Is that the only way you know them?—A. Also by the name of the grantee.

Q. Did you ever read the papers all through?—A. I read them all through, but do not remember all the contents thereof, as it is many years since.

Q. You state in your direct examination that you did not remember whether or not you ever brought a copy of this papers to the surveyor-general's office; now what are the facts about it?—A. I do not remember whether I brought a copy or no, but I believe the copy was with the papers I brought.

Q. You state that the general reputation in regard to the time the grant papers were in the possession of the owners, was that they were in their possession from the time they were executed. Now state from whom you derived such information, name the parties?—A. Antonio Serafin Lucero, Manuel Lucero, José Juan Lucero, Meregeldo Lucero, Laureano Lucero, Pablo Lucero, Telesforo Lucero, José Maria Lucero, Juan Teodoro Lucero, Francisco Lucero, José Lucero, Cristobal Lucero, from the above persons I derived the information that the grant was in the hands of the owners since it was made.

Q. When and where did Antonio Lucero tell you anything about it?—A. At Peña Blanca in 1849.

Q. When and where did Manuel Lucero tell you anything about it?—A. At Peña Blanca, at the same time, he being a brother of Antonio Lucero.

Q. When and where did José Juan Lucero tell you anything about?—A. I cannot tell what day or what year, but it was since 1849, when all have told me about it, José Juan Lucero told me about it at Cochiti, after I was married, in the year 1849; do not remember the day or year.

Q. All these parties you have named claim to be interested in the grant, are they not?—A. They are all heirs of the grant.

Q. Did you ever hear any one else in conversation with you say anything about the time the papers have been in the possession of the owners?—A. I have been told also by Manuel Hurtado that the people of the Cañada de Cochiti lived on the grant for many years. I heard that long before I was married.

Q. Was he interested in the grant?—A. I do not know.

Q. Were there any other parties with whom you held any conversation on the subject of those papers?—A. If I am to name all the persons I would have to name all the people of Peña Blanca. I heard Antonio Terrioteo Armijo speak about these papers. I did not write a history of the case, and therefore do not remember exact dates. I heard him speak about the papers, but do not know whether it was in the years of 1849 or 1850, or afterwards.

Q. What did this man say about them; state the conversation, and how did he come to mention it?—A. Talking about the feast of Guadalupe he said, many years past he used to go to the feast at that place. He said that when they used to go there, there were great many people there, and that Loreto Lucero had many cattle and the Navajo Indians drove them all away and killed him in his house. He said nothing about the papers, simply said they lived on a grant.

Q. Was this conversation about the grant papers before or after you first saw them?—A. My father-in-law spoke to me about them before I saw them the first time, and then showed the papers to me. The other parties I heard speaking about them afterwards.

Q. Is it not a fact that when these parties spoke of the papers generally, that the copy was never referred to as distinguished from the other papers?—A. They spoke about the copy, but José Jon called it "Patrio Real."

Q. Is it not a fact that the first you knew of your own knowledge about the copy was this morning when it was shown you?—A. I knew of the copy, but did not know whether it had been brought here with the other papers or not until I saw it this morning.

Q. Then you do not know whether you brought the copy here with the other papers or not, as it might have been left here by some other person, might it not?—A. I do not know whether I brought it or not. It might have been brought by some one else.

Q. Then you really know nothing about the copy, of your own knowledge, except what you have acquired to-day?—A. I saw it in the hand of my father-in-law, and can prove it if so required.

Q. When and where did you see it in his possession?—A. I saw it at Peña Blanca, at his house, in the year 1849, when I was married; I read it at that time.

Q. How far is Peña Blanca from this grant?—A. Am not sure, but think it is about five or six miles.

Q. How long did you live in Peña Blanca?—A. Lived at Peña Blanca all the time since 1849, with the exception of 8 years I lived in Conejas, Colo.

Q. Were you ever at the Cañada on the grant?—A. I have been there many times to see my father-in-law.

Q. Did your father-in-law live on the grant or at Peña Blanca?—A. He lived on the grant for a short while; he moved to Peña Blanca, but returned to the grant.

Q. Do you know anything about the boundaries of the grant? If so, state what they are?—A. The eastern boundary is the Rio Grande; the west boundary the top of the Jemez Mountains; the north boundary is the old pueblo of the Cochiti Indians, and the southern boundary is where the line touches the league of the Indian of Cochiti of the present pueblo.

Q. In what direction from the new pueblo is the old pueblo of Cochiti; and how far?—A. I have no personal knowledge of the old pueblo. I gave the boundaries as I saw them in the grant papers, and was told so by old people there.

Q. Did you ever see the west boundary of the grant?—A. No.

Q. How do you know that these are the boundaries of the grant?—A. Because it is so stated in the grant.

Redirect examination by Mr. FISKE:

Q. You state that you are not positive whether you brought that copy here or not of the grant papers; what is the best of your recollection and belief on that subject?—A. I am not sure whether I brought the copy or not, but to the best of my knowledge and belief, I think I brought said copy with the papers of the grant.

Q. Do you recollect bringing a paper with those papers, that was signed by Juan Antonio C. de Baca?—A. I do not know whether I brought a paper signed by Juan Antonio C. de Baca, but at the time I heard Mr. Ellison, then acting as interpreter, mention the name at the surveyor-general's office.

Q. How did Mr. Ellison come to mention that same?—A. When I came to the surveyor-general's office I saw Mr. Ellison holding the paper, and heard him mention the name of Juan Antonio C. de Baca; I suppose he read it from the paper.

Q. Did you take a copy of the papers you brought at the time you brought them?—A. Yes.

Q. Where is that copy now?—A. The copy and receipt are in the hands of Pablo Lucero; Pablo Lucero is at the Cañada de Cochiti.

Q. Who made that copy and receipt?—A. The copy and receipt was handed me by Mr. Ellison, and the receipt was signed by the surveyor-general.

(Witness here was handed a paper purporting to be the record of the legal proceedings concerning the Cochiti grant, before Antonio B. Armenta, and was asked if this was one of the papers brought by him to the surveyor-general's office in 1866 or 1867.)

Q. (The witness was now shown the Spanish document purporting to be a copy of the original grant papers of the Cañada de Cochiti grant) and was asked when and where he saw this paper if he ever saw it before.—A. (The witness examines the paper and states) I saw this paper in the hands of my father-in-law at Peña Blanca in 1849, and have seen it since at various times.

Q. State if you can the various dates and places since 1849 which you have seen this paper, and in whose possession it was when you saw it.—A. After my father-in-law died the papers fell into the hands of Francisco Lucero, and then they came in my possession, when myself and Roman Baca, as commissioners, brought the papers to the office of the surveyor-general with Sam Ellison. These persons were all heirs to the grant. At that time the heirs of the grant had a meeting and named a commission composed of myself and Roman Baca, to bring the papers of the grant to the office of the surveyor-general; Mr. Ellison also came with Roman Baca and myself; it is possible that he was also a commissioner, but I do not remember.

By the SURVEYOR-GENERAL:

Q. Who brought the papers, you or Roman Baca?—A. I brought the papers to Santa Fé and delivered them to Mr. Ellison, who delivered them to the surveyor-general, and I was present when he delivered them to the surveyor-general.

Q. When the papers were handed you to bring here, were they wrapped up or sealed?—A. They were wrapped up in a handkerchief.

Q. Did you undo them when you were on the way?—A. No.

Q. Then when you received and delivered them they were wrapped up in a handkerchief?—A. Yes; they were wrapped in a handkerchief when I handed them to Ellison; he opened them and handed to the surveyor-general.

Q. Did you examine or read them after they left your possession, after you handed Mr. Ellison the package?—A. The surveyor-general showed the papers to me after Mr. Ellison delivered them to him. I did not read them, but glanced over them and saw they were the same papers.

Q. Who was the surveyor-general at that time?—A. I do not remember, but I have a receipt with his name signed to same.

his
FELIPE + SANDOVAL.
mark.

Subscribed and sworn to before me this 21st day of July, A. D. 1882.

HENRY M. ATKINSON,
Surveyor-General.

Adjourned to ten o'clock a. m., July 22, '82.

Investigation resumed pursuant to adjournment this July 22, 1882.

Present, H. M. Atkinson, surveyor-general; Ireneo L. Chaves, special interpreter; E. A. Fiske, attorney for claimant.

MARIANO SALAS, being duly sworn, deposeth and saith:

By Mr. FISKE:

Question. Will you state your occupation, residence, and year in which you was born?—Answer. My name is Mariano Salas; am a farmer by occupation; I was born in the year 1808; my residence is at a place called La Bentana, on the Rio Puerco, Bernalillo Co., New Mexico.

Q. Where were you born?—A. I was born at La Cañada de Cochiti, within the limits of the Cañada de Cochiti grant.

Q. From 1808 for how many years did you reside on the grant?—A. I resided there about 28 years after 1808.

Q. Who were in possession of that grant, if anybody was in possession of it?—A. There were many people living there then, and I suppose they all were heirs to the grant.

Q. Was there any one at that time who owned an interest in the grant?—A. My father and grandfather lived there, and they were heirs to the grant.

Q. Were there any other persons at that time who were heirs of the grantees?—A. There were several others who claimed to have been heirs of the grantees living on the grant.

Q. You say you were residing on the grant in 1817?—A. Yes.

Q. Who was alcalde of that jurisdiction in that and the following year?—A. I think the alcalde then was Esteban Aragon, though I am not positive.

Q. Who was the first alcalde of that jurisdiction you have any recollection of?—A. The first alcalde I knew of there was Juan Antonio C. de Baca.

Q. In what year did Juan Antonio C. de Baca die?—A. He died in 1821.

Q. Was he alcalde at the time of his death?—A. I believe he was alcalde at that time.

Q. For how many years prior to that time was he alcalde?—A. He was alcalde, I believe, from the time I reached the age of reason up to the time of his death.

Q. Were there any town in existence on this grant in 1821?—A. There was a town on the grant then; the same town is there yet.

Q. Was there but one town in 1821?—A. There were two towns then, but one had been abandoned on account of the great danger of Indian depredations.

Q. Who has been in possession of that grant since you knew it?—A. José Juan Lucero, Cristobal Lucero, Laureano Lucero, Telesforo Lucero, and all their relatives.

Q. Were those persons heirs of the grantees?—A. They were heirs of the grantees.

Q. Within what boundaries did they have possession under that grant?—A. North boundary, El Rito de las Frijoles; south boundary, the league of the Cochiti Indians; eastern boundary, the Rio del Norte, and the west boundary is the top of the Jemes Mountain.

Questions by the SURVEYOR-GENERAL:

Q. Can you read or write?—A. I can read some but cannot write.

Q. Can you read writing?—A. I cannot read writing.

Q. How do you know there is such a grant as the Cañada de Cochiti?—A. Since I was born I heard my father say there was such a grant, and some of the other people there, they also gave the boundaries.

Q. Then all you know about it is what some one else has told you?—A. I know it because I lived there and have been through the grant many times.

Q. Did you ever see any documents of title or any other evidence of this grant?—A. I never saw any.

Q. Then how do you know of your own knowledge that there ever was a grant there?—A. I only know what my parents told me.

Q. Then you know nothing about the grant except what you have been told?—A. I only know what I have been told.

Q. How many people lived on the grant when you first knew it?—A. There lived a large number of people on the grant at the Cañada de Cochiti.

Q. Can you state upon your own knowledge that any of these parties about whom you have testified as living on the grant and being heirs of the grantees were such heirs?—A. I know of my own knowledge that they were heirs.

Q. How do you know it?—A. I knew them to be heirs because they had possession of the land and claimed the right to it.

Q. Is that the only way you know it?—A. Yes, sir.

Q. How do you know that Juan Antonio C. de Baca was alcalde of that jurisdiction when he died in 1821 and previous thereto as you have testified?—A. Because he sent a campaign at that time against the Navajos.

Q. Is that the only means you have of knowing that he was alcalde at that time

and previous?—A. Yes; that is the only means I have of knowing that he was alcalde then and prior to that time.

Q. How do you know what the boundaries of the grant are?—A. Because my father told me what the boundaries were, and I have seen them since.

Q. How far is it between the north and south boundary?—A. There are, more or less, about six leagues.

Q. Then the north boundary is about seven leagues from the present pueblo of Cochiti?—A. Yes; it is about seven leagues, more or less.

Q. How far is it from the Rio del Norte, the east boundary, to the west boundary?—A. There are about seven leagues, more or less.

Q. What mountain is it that is called Sierra de Jemez?—A. The highest mountain west of the Rio del Norte is the Sierra de Jemez.

Q. In what direction is the Jemez Mountains from the present pueblo de Jemez?—A. It is to the east of the pueblo of Jemez—this side.

Q. How long has that been known as the Jemez Mountains?—A. Since the time people first inhabited the Cañada de Cochiti.

Q. Where are the Valles Mountains?—A. On the same range of the Valles Mountains.

Q. Are there any other mountains between the Jemez Mountains and the Rio Grande on the east?—A. There are no mountains, but there are mesas and wooded hills.

Q. You inherited interest in this grant from your parents, did you not?—A. Yes, sir.

Q. Then you have an interest in the grant?—A. Yes; I have there my property and that of my parents.

Q. Where have you resided since you moved from the grant in question?

(This question was suggested by Judge Downs, counsel for claimants.

(Objection made to question and answer thereto, unless Judge Downs appears in the case for some interested party.)

A. I moved to Santa Fé from Cañada de Cochiti, and lived there 9 years; then went to Peña Blanca, about two and a half leagues from the grant; moved to La Bentana. I lived there ever since.

Redirect examination by Mr. FISKE:

Q. State, if you know, what high or prominent hills or mountains there are on the Cañada de Cochiti grant, going from the Rio Grande River, the east boundary of the grant, going west to the Sierra de Jemez; commence at the east boundary and describe them in the order from east to west.—A. The first mountain is called Surreta de San Miguel; it is very high. The next going west is a peak called "Cerrito de las Balitas"; this peak is high but not as high as the first named. The next mountain going west is called "Ceno del Chato"; it is not very high. From there going west there are no mountains until you reach the Sierra de Jemez.

Q. During the time that you testified that Juan Antonio Cabeza de Baca was alcalde, state whether or not the people who resided on the Cañada de Cochiti grant and vicinity generally recognized him as the legal alcalde of that jurisdiction.—A. Yes; all the people there recognized him as the legal alcalde there.

By SURVEYOR-GENERAL:

Q. How did the people of the Cañada de Cochiti recognize him as alcalde?—A. Whenever the Indians committed any depredation he used to send the people after them and they always obeyed him.

Q. Is that the only way you know they recognized him as alcalde?—A. Yes.

Q. What year was it that he ordered them to fight the Navajos?—A. I heard that they were sent in the year of 1819 and 1820; he died in 1821.

Q. Then you derived your knowledge of what you testified to from others who told you about it?—A. I knew personally that he was alcalde then, because he nominated my father to go on the campaign; I was there and saw it.

Q. Did you hear the alcalde direct your father to go on the campaign?—A. He was ordered out by the constable by order of the alcalde.

Q. What did the constable say to your father?—A. He told him to get ready with his arms and provisions to go out on the campaign against the Navajos.

Q. How old were you then?—A. About nine or ten years.

Q. And that is the reason you state he was alcalde, is it?—A. That is the reason I knew he was alcalde.

Questions by Mr. FISKE:

Q. During the time mentioned that you knew him as alcalde, did he do any other official act as alcalde that you know of in addition to those you testified to?—A. I do not know.

his
MARIANO + SALAS.
mark.

Subscribed and sworn to before me the 21st July, A. D. 1882.

H. M. ATKINSON,
Surveyor-General.

Examination of witnesses in the investigation of the Cañada de Cochiti (Antonio Lucero) grant resumed this August 17, 1882.

Present, Henry M. Atkinson, surveyor-general; David J. Miller, translator and chief clerk, and H. L. Warren, attorney for grant claimants when—

JESUS MARIA CABEZA de BACA, being first duly sworn by the surveyor-general, on his oath declares:

By Mr. WARREN:

Question. What is your name, occupation, and residence?—Answer. My name is Jesus Maria Cabeza de Baca; my occupation is farmer, and my residence is Peña Blanca in Bernalillo County, and Territory of New Mexico.

Q. What is the date of your birth?—A. I was born in February, 1808, but do not know what day of that month.

Q. Were you acquainted with Juan Antonio Cabeza de Baca in his life-time? and, if yea, state what relationship existed between you and him, if any, and whether he is living or dead; and, if dead, the date of his death.—A. Juan Antonio Cabeza de Baca was my father, and of course I was acquainted with him. He died in the year 1835, in the Navajo country, being killed by the Navajo Indians when on a campaign against them, but I do not remember in what month of that year it occurred.

Q. Did your ever see you father, Juan Antonio Cabeza de Baca write; if so, how frequently, and do you know his handwriting?—A. I have often seen him write, and know his handwriting and his signature. He was a justice of the peace, and I often saw him write in his office. [Here witness was show a paper in the Spanish language, endorsed in English upon the back as follows: "File 95, Felipe Sandoval Roman Baca. Filed in the surveyor-general's office by Felipe Sandoval and Roman Baca, April 1, 1867. John A. Clark, Sur. Gen'l." And now marked at the commencement thereof Exhibit B, and is asked the following question:]

Q. Do you know in whose handwriting the signature Juan Antto Cabeza de Baca signed to said document, Exhibit B, is? If so, state.—A. I do know it. It is the writing of my father.

Q. In whose handwriting is the certificate and signature thereto appended to said document, Exhibit B?—A. I think the writing in the body of the certificate is in my father's handwriting, and I am sure the signature to it is his writing.

Q. What official position, if any, in the jurisdiction of Cochiti, did your father occupy?—A. He was alcalde.

Q. During what years, as you remember, was your father alcalde, and how many times?—A. I do not remember in what years he was alcalde, but he was such for various terms.

Q. When do you first remember his being such alcalde?—A. I first knew he was alcalde when I was about eight or nine years old, and he may have been before.

Q. [The witness is shown the signature of Juan Estevan Aragon subscribed to said document, Exhibit B, and also to the certificate appended to said document, and is asked the following question:] Were you acquainted with Juan Estevan Aragon; is he living; and, if not, when did he die?—A. I was. He is now dead. He died, I think, about the year 1823 or 1824. He was alcalde also.

Q. Did you ever see Juan Estevan Aragon write, and do you know his handwriting and signature?—A. I did; he was my schoolmaster, and I believe I know his writing, having often seen him write, and he was also private secretary of my father.

Q. In whose handwriting are the said signatures of said Juan Estevan Aragon signed to said document and certificate now shown you and identified as Exhibit B?—A. They are the signatures of said Aragon.

Q. What official position, if any, did said Aragon occupy for your father when you first knew of the latter being alcalde?—A. He was his secretary and clerk of his alcalde's court.

Q. In whose handwriting is the said document, Exhibit B, now shown you, commencing with the words "Es copia" down to and including the words "doy fee"?—A. I believe it is Juan Estevan Aragon.

Q. Did you know Luis Maria Cabeza de Baca; if so, is he living or dead; and if dead, when did he die?—A. I did; he was my grandfather, and he died about the year 1823, 1824, or 1825.

Q. Did you know his handwriting; did you ever see him write; and, if so, how often?—A. I did know it, having frequently seen him write. He wrote an ugly grotesque hand.

Q. In whose handwriting is the signature subscribed to said Exhibit B, now shown you?—A. I believe it is the signature of my grandfather, Luis Maria Cabeza de Baca, for that is the way he wrote.

By the SURVEYOR-GENERAL:

Q. Have you any interest in the result of this investigation?—A. I have none.

Q. Do you know anything in relation to the boundaries of the Cañada de Cochiti grant as to the localities?—A. I do not know where they are, or what.

Q. You state in your direct examination that when you were eight or nine years old your father was alcalde; I want to know how you know he was alcalde at that time.—A. I know it by the fact that that business was transacted before him by the people going there to settle their questions before him, and know that the alcaldes were elected by the people, and he was one of the alcaldes.

Q. What jurisdiction was he alcalde of?—A. Of the precinct, or as then called the jurisdiction of Peña Blanca, embracing Santo Domingo, Cochiti, and the Cañada.

Q. What was the name of that jurisdiction, as then called?—A. It was called indiscriminately the jurisdiction of Peña Blanca, of Cochiti, of Cañada and San Buenaventura, and Santo Domingo.

Q. Can you state positively that the name of Luis Maria Cabeza de Baca, which appears on Exhibit B, heretofore shown you, is his genuine signature?—A. I can say positively it is.

Q. Can you say positively that the names of Juan Antonio Cabeza de Baca, and Juan Estevan Aragon, which appear on said Exhibit B, are their genuine signatures?—A. Yes; they are their signatures.

Q. How do you know them to be such?—A. Because I have seen them write; Aragon was my schoolmaster, and I attended his school at Cochiti, whence he used to write letters to my father.

Q. Did your father and the other alcaldes keep a record of their official acts?—A. Of course they keep a record of their official acts, as all the alcaldes did, and which record they delivered to their successors.

Q. Is the alcaldes' record of that jurisdiction still in existence; and, if so, where can it be found?—A. I presume it is in existence, and in the keeping of the present alcalde, Felipe Sandoval, as the records pass to successors in office.

Redirect by Mr. WARREN:

Q. When did you last see the alcaldes' records last spoken of?—A. I cannot recollect; I had these archives in my possession as alcalde two terms, and when I turned them over, I believe, I did not see them afterwards. My successor, to whom I turned over the archives, was Jesus Maria Montoya, now deceased. It was, I now remember, in the year 1837, when Armijo was governor.

Q. Were those records kept in bound books or bundles, or in what way?—A. Only in bundles, and a catalogue or list of them was given upon the change of authority.

JESUS M. C. DE BACA.

Subscribed and sworn to before me this August 17, 1882.

H. M. ATKINSON,
Surveyor-General.

JUAN LOPEZ, being, by the surveyor-general sworn, on his oath declares:

By Mr. WARREN:

Question. What is your name, residence, and occupation?—Answer. My name is Juan Lopez; my place of residence is Peña Blanca, in the county of Bernalillo, and Territory of New Mexico, and my occupation is farmer.

Q. In what year were you born, and where?—A. In the year 1807, at Peña Blanca.

Q. How long have you lived at Pena Blanca?—A. All my life-time.

Q. Did you know Juan Antonio Cabeza de Baca? If so, did you ever see him write, and do you know his handwriting and signature?—A. I knew him, and have seen him write, and know his handwriting and his signature.

Q. In whose handwriting are the respective signatures, purporting to be those of Juan Antonio Cabeza de Baca, subscribed to the document marked Exhibit B, and to the certificate appended thereto, respectively, now shown you?—A. They are both in the handwriting of Juan Antonio Cabeza de Baca.

Q. What official position, if any, did Juan Antonio Cabeza de Baca occupy during his life, and at what periods?—A. So far as I know, the position of justice or alcalde. I cannot say in what years or how long ago he was the alcalde, but when I first knew him as such was when I was about nine or ten years of age.

Q. Did you know him on Dec. 30, 1817? If so, state what you know of his official position at that time.—A. I did, and he was then alcalde.

Q. What was the jurisdiction called of which he was alcalde?—A. The jurisdiction of Cochiti.

Q. What public acts, if any, have you seen him perform as such alcalde?—A. He gave orders and tried suits brought before him. He was elected by the people and performed his official duties at his public office, which he had at his residence as alcaide.

Q. In whose handwriting is the certificate appended to the document marked Exhibit B, commencing with the word "Ante," and ending with the words "doy fe," now shown you?—A. It is the handwriting of the said Juan Antonio Cabeza de Baca.

Q. Did you know Juan Estevan Aragon and Luis Maria Cabeza de Baca, respect-

ively? If so, do you know their handwriting, and have you seen them write?—A. I knew them both; have seen them write and know their handwriting.

Q. In whose handwriting are the respective signatures "Juan Estevan Aragon" and "Luis Maria Cabeza de Baca," subscribed to the document marked Exhibit B, now shown you?—A. The one was written by Juan Estevan Aragon and the other by Luis Maria Cabeza de Baca.

Q. Do you know in whose handwriting is the said document Exhibit B, commencing with the words "Es copia," down to and including the words "doy fee"?—A. It appears to me to be the writing of Juan Estevan Aragon.

Q. Is Juan Estevan Aragon living or dead?—A. He died so many years ago that I do not remember when.

Q. What position, if any, under Juan Antonio Cabeza de Baca did said Aragon occupy in the year 1817?—A. He was his secretary.

Q. Is Luis Maria Cabeza de Baca living or dead, and if dead, when did he die?—A. He is dead many years, but how many I cannot state now.

Q. Did you know Juan Gonzales and Sebastian Salas, or either of them?—A. I have heard them mentioned in Cochiti, and I believe I knew them both.

Q. Are they, respectively, living or dead?—A, They are both dead.

Q. Do you know the handwriting of either of them?—A. I do not.

Q. Do you know a tract of land known as the Cañada de Cochiti grant? If so, state where it is situate, and how long you have known it.—A. I do know such a tract, and have known it since I can remember. It is situated in the Cañada de Cochiti, in the County of Barnalillo and Territory of New Mexico.

Q. Who were in possession of that tract of land when you first knew it, and have continued in possession since?—A. The Luceros.

Q. Who do you man by the Luceros—the descendants of whom?—A. I mean the Luceros the descendants of the grantee, Antonio Lucero.

Q. Do you know the boundaries of the tract known as the Cañada de Cochiti grant?—A. I do know them.

Q. What is the boundary of the said grant on the north?—A. The old pueblo of Cochiti.

Q. What is the southern boundary?—A. The Alto de las Cruces, and the lands of the Indians of the pueblo of Cochiti.

Q. What is the boundary on the east?—A. The Rio del Norte.

Q. What is the western boundary?—A. The top of the Sierra de Jemez, so called.

Q. How long have you known the boundaries you have given to be the boundaries of the said grant?—A. For a great many years, and as long as I can remember I have heard them referred to as the boundaries among the people.

Q. Among what people do you mean?—A. I mean among the old people of Peña Blanca and that vicinity.

Q. Do you know the mountain you have referred to as the Sierra de Jemez forming the western boundary, and, if so, how long have you been familiar with it?—A. I do know it, and have known it since I was large enough to commence herding stock.

Q. How long have you known that mountain to be known as the Sierra de Jemez?—A. I have known it to be called the Sierra de Jemez ever since I was a boy eight, nine, or ten years old.

Q. Do you know the present Indian pueblo of Jemez?—A. I do know it.

Q. In what direction from that pueblo is the Sierra de Jemez, of which you have spoken, and how far?—A. The sierra is to the west of the pueblo, and is about half a league distant, somewhat more or less.

Q. Going from the Sierra de Jemez eastward to the Rio del Norte, is there any high mountain or range of mountains, and, if so, what are they called or by what name are they known? [Question withdrawn and the following submitted:]

Q. Are there any mountains between the Rio del Norte and the Sierra de Jemez within the boundaries of the grant you have named? If so, by what name are they known?—A. The only one is the Sierra del Balle or Sierra Alta.

Q. Do you know of any other mountain or sierra than that you have named as the western boundary to be called or known as the Sierra de Jemez?—A. I do not.

Q. Are the Balle Mountains you have spoken of as called the Sierra del Valle, situated eastwardly or westwardly from the present pueblo of Jemez?—A. Towards the north.

Q. What is the distance from the Rio del Norte to the Sierra de Jemez within the grant?—A. Fifteen leagues, more or less.

Q. What is the distance between the north and south boundaries of the grant of the Cañada de Cochiti?—A. About three or four leagues.

Adjourned to nine o'clock to-morrow morning.

Investigation resumed at nine o'clock Friday morning, August 18, 1882.

By the SURVEYOR-GENERAL:

Q. How far back and to what year can you remember the occurrence of any event in your life?—A. To when I was about ten years old.

Q. What event occurred at that time that you remember?—A. I remember that at that time the Navajo Indians made a descent upon the people of the Cañada de Cochiti.

Q. In what year and month of the year was this raid made?—A. I cannot now remember just the year or the month of the year in which it occurred, but it occurred somewhere about the years 1817 to 1821.

Q. Where were you living then, and what did you do?—A. I was living at Peña Blanca, and engaged in farming affairs.

Q. What were you doing in 1817?—A. I was at school.

Q. How often did you see Juan Antonio Cabeza de Baca at that time?—A. As he lived then at Peña Blanca I saw him continually.

Q. At what times and how long was he alcalde?—A. I cannot say at what times or in what years he was alcalde, but he was repeatedly in the office of alcalde.

Q. Then you do not know positively that he was alcalde in 1817?—A. He was alcalde, then the first year I knew him, and when I was at school at his house in that year.

Q. Did you see him perform any official act during that year; if so, what?—A. I did, such as official orders of alcalde, which were executed by the officials.

Q. What orders? State some specific one.—A. Orders in matters of the people pending before him. I remember no particular instance.

Q. How do you know these were official orders given as alcalde?—A. Because they were issued by him and were obeyed.

Q. Have you had any conversation with any one as to what you would testify to in this case?—A. I have not.

Q. You have testified that Cabeza de Baca was alcalde on December 30, 1817—I want to know how you remember that particular date so well?—A. From the papers in my possession; I having some showing that he was alcalde at that time.

Q. What is the nature of those papers?—A. Land documents, papers relating to land purchases in Peña Blanca, being deeds of conveyance, and so forth, authenticated before said Juan Antonio Cabeza de Baca as alcalde.

Q. At what dates were they authenticated? Was any of them authenticated in 1817?—A. Yes; as he was then alcalde.

Q. What document or documents were authenticated by him in 1817?—A. I cannot say what particular ones, but he authenticated documents in that year.

Q. Did you ever read any of the documents?—A. Yes; I read some of them.

Q. Describe any one of those documents by date, and when issued, and to whom.—A. I cannot remember the particulars of any one of them.

Q. Then your knowledge of Cabeza de Baca being alcalde in 1817 was derived from seeing documents authenticated by him that year?—A. Yes, and also from the fact that he was elected by the people.

Q. Were you present at the election?—A. I was there in the community and saw the primany meeting, etc., but was too young to participate, the meeting being at the house of Cabeza de Baca when I was there at school.

Q. When you first knew Cabeza de Baca as alcalde what year had he been elected as such?—A. In the year 1817.

Q. Is it not a fact that the election occurred in 1818?—A. No.

Q. In what time of the year was the election?—A. I do not remember.

Q. Wher and where did you first see said Cabeza de Baca write?—A. At his home in the year 1817.

Q. What was he writing then?—A. I do not know what, but he was writing.

Q. How often have you seen him write?—A. A great many times.

Q. About when was the last time you ever saw him write?—A. I cannot remember when.

Q. At the time you saw him write can you state what document he was writing at any one time?—A. I cannot.

Q. How did you come to see him writing at any time?—A. By seeing him writing on casual occasions as when at the school-house.

Q. Did he have the school at his residence?—A. He did.

Q. How often did you ever see Luis Maria Cabeza de Baca write, and when and where?—A. I have not seen him write, but I have seen his handwriting.

Q. If you never saw him write how do you know it was his handwriting?—A. never saw him write, but I have seen his signature.

Q. That is, you have seen his name, but never having seen him write you do not intend to swear that what purports to be his signature on Exhibit B is his bona fide signature, do you?—A. Never having seen him write I cannot swear that the name is his own signature.

Q. Have you ever been at the old pueblo of Cochiti?—A. I have.

Q. How far is it from the Rio Grande and in what direction?—A. About a league, more or less, towards the north.

Q. What year did you commence to herd stock?—A. In about the year 1817.

Q. How long did you continue to herd?—A. I was not a regular herder, but went sometimes out on that business.

Q. How much of the time in 1817 were you herding?—A. Not more than a month, and that to assist at the lambing.

Q. Where were you lambing at that time?—A. I do not remember where in that year, 1817, as we lambed at different places in different years.

Q. How did you acquire a knowledge of the location of the Sierra de Jemez?—A. By hearing it so called by the old settlers as I passed through the neighborhood and the pueblo of Jemez, which is adjacent.

Q. Is it not a fact that the mountains immediately near to the Jemez pueblo, both on the northeast, north, and northwest of said pueblo, are called the Jemez Mountain and have been so known for many years?—A. No; only the one I described as to the west of the pueblo of Jemez—the others are the Valle Mountain and some wooded hills to the north.

Q. How do you know that the Luceros had a grant at the Cañada de Cochiti?—A. Because I have always heard so, and have always seen settlers at the place.

(Mr. Amado Chaves here appeared and stated that as part owner of the Cañon de San Diego grant he desired to enter an appearance as a party interested, and waived notice so far as the taking of testimony of the witnesses now present are concerned, and requested that C. H. Gildersleeve, his attorney, be notified of the time and place of taking further evidence.)

Q. Then all you know in relation to a grant at the Cañada de Cochiti and to the location of the Sierra de Jemez is from what you have been told by others, the latter by general reputation, is it not?—A. Yes.

Q. Have you any interest in this grant?—A. I have not.

Redirect by Mr. WARREN:

Q. From what fact or circumstance is it that you are able to remember the official position and acts of Juan Antonio Cabeza de Baca in the year 1817?—A. Because I happen to retain the fact in my memory, and if I did not know what I have stated to be true I would not have so declared.

Q. In what year did you first go to school and where?—A. In the year 1817, and at the house of Juan Antonio Cabeza de Baca.

Q. You have stated that the only way you know the location of the Sierra de Jemez, and that the Luceros had a grant called the Cañada de Cochiti is from what others have told you. Please state when and by whom you were first so told, whether such facts are matters of general reputation among the people of that vicinity, and how long they have been so.—A. Yes; from what others have told me from about the year 1817 down to the present time, and these are matters of general repute among the people of that section and have always been so.

Q. From what circumstance did you testify on your direct examination that you knew the handwriting of Luis Maria Cabeza de Baca?—A. I know his handwriting from having often seen what I was informed and believe was his, and from the writing shown me here in this examination and its similarity to that I have seen I am satisfied it is his writing as I declared I believed it to be.

JUAN LOPEZ.

Subscribed and sworn to before me this 18th day of August, 1882.

HENRY M. ATKINSON,
Surveyor-General.

SEPTEMBER 22, 1882.

MARIANO SALAS recalled.

By E. A. FISKE, of Fiske & Warren, counsel for grant owners:

Question. In your former testimony the following question to you and answer by you appear: "Q. In what direction is the Jemez Mountains from the present pueblo de Jemez?—A. It is to the east of the pueblo of Jemez, this side." Is that question and answer correct, and have you any explanation to make in reference to it?—Answer. No; the question is not right, as I understood it. It was, what direction was it from the Sierra de Jemez to the pueblo de Jemez. The pueblo is to the east of the Sierra, and on this side of it.

Q. Is the way in which you answer the question now the way in which you answered it in your former testimony?—A. I answered then as I answer now, that the pueblo is to the east, or, in other words, on the hither side of the Sierra.

By the SURVEYOR-GENERAL:

Q. Did you not in your former testimony state positively that the Sierra de Jemez, referred to as the west boundary of the grant in question, was east or northeast of the Indian pueblo of Jemez, and on this side of said pueblo?—A. I stated in giving

the north, southeast, and west boundaries that the west boundary was the Sierra de Jemez. I did not, but I sta ed that the Pueblo of Jemez was to the east of the Sierra de Jemez, and that the Sierra de Jemez was to the west of the pueblo; that was my answer.

Q. In what direction are the Valles Mountain from the Jemez Mountain, and how far are they apart?—A. It is to the north, and it is about six or seven leagues between them, the Jemez River running between them.

his
MARIANO × SALAS.
mark.

Sworn to and subscribed before me this September 22, 1882.

H. M. ATKINSON,
Surveyor-General.

UNITED STATES LAND OFFICE,
Santa Fé, New Mexico, Nov. 25th, 1882.

Hon. HENRY M. ATKINSON,
Surveyor-General for New Mex.:

SIR: Some three months or so ago I discovered that an attempt was being made, by one Whitney, through his attorneys, Messrs. Fiske & Warren, to have a grant by the name of "Cañada de Cochîti" approved. I do not know whether the grant is genuine or not, but I do know that they are trying to perpetrate a fraud upon the Government as well as upon many people of this Territory by trying to prove that one—the boundaries of said grant—La Sierra de Jemez, the west boundary—is far beyond from where it really is. If the grant is approved, as they claim it, the Government will be swindled out of an immense number of acres of land, and as a number of other grants would be taken in the survey of this grant, many people would lose their homes and suffer a great deal.

The "Cañada de Cochiti" grant is a very old grant, much older than any of the other grants that it would take in, if approved and surveyed, as claimed by said Whitney, thereby destroying the others by virtue of priority.

This grant is situated on the west side of the Rio Grande and east of the Jemez Mountains, the west boundary of the grant. Now, what said Whitney is attempting to prove is that the *west* side or portion of the Jemez Mountain is the boundary of the grant instead of the east side. The Jemez Mountain is partially divided at some places by long cañons, thus leaving the *east* portion of said mountains a long distance from the west portion. When said Whitney (J. G.) examined said grant *he informed me* that the people living on the same *showed him* the location of the west boundary of said grant, which was a portion of a mountain west of the grant, but a long distance from the west portion of the Jemez Mountains (the boundary he claims now).

When I discovered the attempt that was being made I requested you to allow me time in which to prove to you, by competent witnesses that the statement I have made above is correct. Unfortunately I was taken sick at that time, and for the last three months have been confined to the hospital, severely ill, and even to-day I am unable to leave my room. For this reason alone have I failed to present my witnesses to you for the purpose of having them examined. I do not wish to delay action by your office in this case; I simply wish to request that this letter may be filed in the case, to show why I failed to present the evidence I promised, and as a request that if ever I get well I may be permitted to furnish said evidence hereafter.

I am, sir, very respectfully, your ob't servant,

AMADO CHAVES,
Land Commissioner for the Territory of New Mexico.

FLORENCIO SANDOVAL, being duly sworn, on his oath declares:

By C. H. GILDERSLEEVE, for contestants:

Question. What is your name, age, occupation, and place of residence?—Answer. My name is Florencio Sandoval; my age is forty-three; am a stock-herder and merchant, and live in Algodones, in Bernalillo County, Territory of New Mexico.

Q. Do you know the town of Cochiti, and, if so, how long have you know it?—A. I know it, and have known it for twenty-five years.

Q. Are you familiar with the mountains and surrounding country at Cochiti?—A. Yes; I was born at San Isidro, and am familiar with the country about Cochiti.

Q. With reference to the town of Cochiti, do you know where the Jemez Mountains are?—A. Yes.

Q. In what direction are these mountains from the town of Cochiti?—A. They are west of Cochiti.

Q. How far west of Cochiti to where the Jemez Mountains commence?—A. About two miles west of Cochiti.

(Question and answer objected to by Mr. Fiske, att'y for grant claimants, on the grounds that the only competent testimony is as to where the mountains are, and witness should not give his opinion, as an expert, as to the commencement of the mountain.)

Q. Do you know of your own knowledge where the Jemez Mountains are [objected to as leading], that have always been recognized by the old inhabitants of Cochiti as the Jemez Mountains, with reference to the town of Cochiti?

(Objected to as leading. Question corrected and objection withdrawn.)

A. Yes; I know the Jemez Mountains, and have always known them, and as they have always been known by the old inhabitants of San Isidro and Cañon de Jemez.

Q. State what distance the Jemez Mountains are west of Cochiti; I mean the nearest point of the Jemez Mountains.—A. All the mountains there are called the Jemez Mountains. They have local names. The first one is called Poleo, which is ten miles from Cochiti to its summit to the west, and the highest point of it is ten miles west of Cochiti, from which the waters flow to the east and west. The nearest point of the Jemez Mountains is about ten miles, more or less; I mean to the top of the mountains.

Q. Is the Poleo Mountain you speak of a part of the Jemez Mountains?—A. Yes; it is a part of what I understand to be the Jemez Mountains.

Q. State whether or not the Poleo Mountain is the highest part of the Jemez Mountains contiguous to Cochiti.—A. Yes; it is the highest that is near Cochiti.

Cross-examination by Mr. FISKE:

Q. Do you know where the main range of the Sierra de Jemez is west of the Rio Grande and west of Cochiti Pueblo?—A. Yes, sir; I know.

Q. Between the main range of the Sierra de Jemez and Cochiti Pueblo are there not various valleys, hills, and small ranges of mountains?—A. There are small hills and small valleys, but no mountains.

FLORENCIO SANDOVAL.

Subscribed and sworn before me this 7th day of February, 1883.

HENRY M. ATKINSON,
Surveyor-General.

The further cross-examination of Florencio Sandoval is postponed until March 6, 1883, to which time this cause is continued.

MARCH 6TH, 1883.

Met pursuant to adjournment.

Present, H. M. Atkinson, sur. gen'l; D. J. Miller, translator; Mr. Whitney claimant.

No witness appearing, cause continued.

OPINION.

Before the United States surveyor-general for the Territory of New Mexico.

J. G. WHITNEY, FOR HIMSELF AND THE HEIRS AND LEGAL REPRESENTATIVES of Antonio Lucero, deceased,
vs.
THE UNITED STATES.

This case is presented before me under the treaty of Guadalupe Hidalgo and the 8th section of the act of Congress approved July 22nd, 1854, establishing this office.

The muniments of title presented as coming from the possession of claimants consist of a torn document, which purports to be the petition, grant, and act of possession given in 1728 to Antonio Lucero to the Cañada de Cochita tract, on the west side of the Rio Grande, in Bernalillo County, New Mexico, together with a certified copy of such original muniments of title, made and certified to in 1817, by Juan Anto. Cabeza de Baca, chief alcalde of Cochiti at that time, and attested by four witnesses, with the apparent intention of perpetuating the form and wording of the original documents of title.

There is also accompanying what purports to be a petition or complaint to the alcalde, by the heirs of Antonio Lucero, dated in 1785, setting forth that their lands, which they had inherited and which had descended to them from their grandfather, Antonio Lucero, were claimed for the use of cavalry animals, and the decision of such alcalde in their favor, regarding the right to the property in question.

The petition of present claimants was filed in this office July 22nd, 1882, with the

documents referred to, but as the petition did not fully conform to the requirements of the rules and regulations of the honorable Secretary of the Interior, they were required to prepare an amended petition, which was filed August 7, 1882.

The petition of claimants alleges that the grant was made to Antonio Lucero August 2, 1728, by Bustamente, the civil and military governor of New Mexico, which at that time was an ultramarine province of Spain, that juridical possession was given to the grantee August 6, 1728, and Lucero thereby acquired a right to the lands claimed.

In the testimony taken Felipe Sandoval, aged fifty-four years, states that he has known the grant since 1866 or 1867, when he brought the grant papers to the surveyor-general's office from the possession of the people on the grant, in Bernalillo County, Territory of New Mexico, as a commissioner appointed for that purpose; that the grant papers and copy thereof had been in the possession of the people on the grant since 1849, to his knowledge, and by common repute they had been in their possession since the concession was made, which was over a century previous. Witness identified title papers as those filed by him in 1866 or 1867, but is not certain that the copy certified to by Juan Anto. Cabeza de Baca was among them, but thinks it was. He knew of and saw the copy in 1849. Witness gives the boundaries the same as those in the alleged title papers.

Mariano Salas, born in 1808, at Cañada di Cochiti, on the land in question, lived there 28 years; his father and grandfather, who were heirs to the grant, lived there; also other heirs lived there. Witness testified that Juan Antonio C. de Baca was the first alcalde of that jurisdiction which he remembers; that he (the alcalde) died in 1821 and was alcalde at that time; that he thinks Estaban Aragon was alcalde there in 1817 and 1818, but afterwards states that Juan Antonio C. de Baca was alcalde also from his earliest recollection until his (Baca's) death. There was a town there in 1821, and the same town is there yet; that the grant was inhabited by the heirs of the grantee. Witness gives the boundaries of the tract the same as those named in the petition, except the Rito de los Frijoles, which he named as the north boundary. His information was based on what his father and others living on the tract had told him. The grant was about seven leagues from east to west and about six leagues from north to south. Witness testified that the Jemez Mountain was east of the Pueblo of Jemez, between it and the Rio Grande, but he was afterwards recalled and stated that he did not understand the question, that he meant to say that the Jemez Pueblo was east of the Sierra de Jemez, although he previously testified that there was no other high mountain between the Rio Grande and what he referred to as the Jemez Mountain. Witness admits having an interest in the grant.

Jesus Maria Cabeza de Baco testifies as follows: Was born in 1808; am the son of Juan Antonio C. de Baca, who was killed by Navajo Indians in 1835. He had often seen his father write. Knows his signature; had often seen him write in his office while he was justice of the peace. Witness identifies the signature of Juan Antonio C. de Baca to Exhibit B, as that of his father, and thinks the body of the certificate thereto was written by him; first knew he was alcalde when he (witness) was 8 or 9 years old, and held the position at various times. Witness also states: Was familiar with the writing and signature of Juan Estaban Aragon, and identifies the same as subscribed to Exhibit B as his genuine signature. The signature of Luis Maria Cabeza de Baca to Exhibit B is also identified by witness as genuine; also that the alcalde's records of that period, he presumes, are still in existence and in the present possession of Felipe Sandoval; that he last saw the records in 1837 when witness turned them over to Jesus Maria Montoya, his successor in office of alcalde.

Juan Lopez, the next witness, testifies that he was born at Pena Blanca in 1807, and lived there; knew Juan Antonio Cabeza de Baca; had seen him write; knew his signature; that the signatures of Baca on Exhibit B are his genuine signatures; that Baca was alcalde Dec. 30, 1817, of the jurisdiction of Cochita. The certificate to Exhibit B is also his handwriting. Witness also identifies as genuine the signature of Juan Estaban Aragon, and believes that of Luis Maria C. de Baca to Exhibit B is also genuine. Aragon was secretary to Juan Antonio C. de Baca. Has known the Cañada de Cochiti grant since he can remember; it was in the possession of the Luceros, descendants of Antonio Lucero, grantee; knows the boundaries and gives the same boundary calls named in the alleged grant papers; that the Sierra de Jemez is west of the Pueblo of Jemez and about 15 leagues, more or less, west of the Rio Grande. Witness had documents in his possession authenticated before Juan Antonio C. de Baca, as alcalde, Dec. 30, 1817, and in that way knew he was alcalde at that time, also was there when he was elected alcalde that year. The grant he knew existed, from general repute among the people of that section, that he first knew of such general repute when he was about ten years old.

There is some variance in the testimony of the witnesses, notably between that of Salas and Baca, as to the date of the death of Juan Antonio C. de Baca; the former fixing the date of his death in 1821 and the latter in 1835; but that is immaterial except in its application to the credibility of the statements of the witnesses in other material portions of their evidence, and while an intentional misstatement of the oc-

currences so many years ago is not attributed to them, yet it is evidence of imperfect recollection of the incidents which transpired at that remote period. The positive statement of the witness, Lopez, that Baca was alcalde Dec. 30, 1817, and his explanation as to how he knew the fact to be true, should have been strengthened and corroborated by the production of such authenticated documents, if in his possession as he states, and if not available, the explanation for their non-production should have been given. The same may be said of the alcalde's records, of that jurisdiction, covering the periods of 1785 and 1817, which should be produced, or their non-production accounted for.

The document purporting to be from the record of proceedings had before the alcalde, Antonio de Armenta, in 1785, is unauthenticated in any manner, and no attempt was made to prove the signatures, or to show its authenticity; it must, therefore, be rejected as evidence in the case; although were it shown to be a part of, or a copy of the record of proceedings had before the alcalde of that jurisdiction, as it purports, it would be a material paper in the case, as tending to show the occupation and possession of the tract by the descendants of the grantee, Lucero, at a period long anterior to that which it would be possible to show by oral evidence, based on the personal knowledge of the witnesses as to the facts and circumstances.

What is called by the claimants the original documents of title in the case, is badly mutilated from some cause, and the signatures of the officials, if it contained such, are torn off. The document is on unsealed paper, contains the reputed signature of Antonio Lucero to the petition, which is apparantly in the same handwriting, and comes from the possession of the claimants, as do all the papers in the case.

There is no record, evidence, or reference to such a grant in the old Spanish or Mexican archives on file in this office, and the title of claimants rests solely upon this copy of the alleged original (Exhibit B) and the oral proofs offered, of long-continued possession.

The first question to be considered is, whether the evidence is sufficient, or of such a nature, that the Government, under its treaty obligations, is in duty bound to acknowledge the claim as a just one; and if it was a title that the Government of Mexico was under obligations to recognize, then in obedience to the letter and spirit of our treaty stipulations, it would be incumbent upon the United States to approve the claim and protect the claimants in their rights to the same extent that they would have been entitled prior to the change of sovereignty.

I assume that it is the policy of this Government to deal fairly by all just claimants in the protection of their private rights, and concede them what they would have been entitled to under the Mexican Government, without the interposition of mere technicalities; yet, where there is no record evidence of a grant in the archives, and the case rests solely, as this does, upon an alleged copy, certified by an alclade and parol proofs of possession for a considerable period, and in view of the facilities that claimants possess of producing parol testimony of almost any character, if so disposed, and which in many instances is known to be utterly unreliable, as shown by experience in the adjudication of this class of claims, it is, under the circumstances, an imperative duty to require the clearest and most satisfactory proofs of the validity of a title or claim presented in this form.

It is a matter of history that the old Spanish and Mexican archives of this territory were loosely kept after the American occupation of the country, and many valuable documents and record books of these titles lost, destroyed, and sold as waste paper under the eyes of a Government official, whose sacred duty it was to preserve and protect them. The fact that these records were so destroyed has opened the door to fraud and invited imposition upon the Government through the means of fraudulent title papers, and necessitating the adoption of some rule as to evidence of title required that may operate harshly, and at times unjustly, toward honest claimants. There is not, however, any general rule that can be laid down to apply to all these cases without operating severely in some instances, and while it is the duty of the political department of the Government to adjust these titles in a spirit of equity and fairness under the treaty obligations, yet the Government has also rights and equities in the premises that must be considered by its officers, which fact should not be lost sight of in the adjudication of such claims.

A certified copy of an ancient original document of title, authenticated by an officer authorized to make the same, for the purpose of perpetuating the instrument, or by the proper official custodian of such title papers where the original has been lost or mutilated, would be receivable in evidence, and would be entitled to almost the same weight as the original. In this instance the governor or secretary of the province was the proper custodian of all grant records and was the proper official to have authenticated the copy. Royal clerks (escribanos) were evidently empowered to authenticate documents of this character; see Lib. 4, Tit. 8, Law 1, 2d White's Recop., p. 57, wherein it is declared: "That all proceedings, judicial and extra judicial, public writings, testaments, notifications, and *others* which are to be made before clerks (escribanos), and attested, legalized, and authenticated by them, shall pass through

and be delivered and acted upon by public, royal escribanos, deriving their title and authority from the kings, our predecessors, or ourselves, through the council of the Indies. * * * And to give more effect to the foregoing, we declare that all instruments, writings, judicial and extra judicial records, made out or acted upon, and all attestations and testimonioes given in violation of this our law, shall be of no effect or value, nor shall be permitted to be offered in court or out of court." * * *

I am unable to find where an alcade was empowered to authenticate any document for purposes of perpetuating the same, and am impressed with the belief that such authority did not pertain to that office. Such being the case the copy would have no more effect as evidence of title than a copy certified by any third party, as the authentication or custody of such ancient documents was not a part of the alcade's official duties, and in that view I see no particular reason for requiring the production or accounting for the non-production of the alcade's record of that jurisdiction for the purpose of showing that Baca was an alcalde at the date of his certificate. Had he been the officer designated and empowered to give the juridical possession, and, as was often the case, directed by the granting authority to furnish the grantee with the proper testimonio, I apprehend that this certificate would have carried the weight and force of an authorized official act; but such is not the case in this instance. I question the propriety of the admission of this document in evidence for any purpose and particularly to show title; yet were it duly authenticated as a copy of some record or by the lawful public custodian of the same, taken in connection with the oral evidence of occupation and possession as testified to by the several witnesses, and on account of the ancient character of the alleged grant and copy, I would admit it for what it might be worth as corroborative of the oral testimony relative to the extent of the tract claimed, and whatever presumption that might arise of a grant from long and continued possession of those claiming under the alleged grantees.

"Though the ancient record of a deed improperly acknowledged is not in itself evidence of the execution of the deed, yet such record, in connection with long and undisputed possession consistent with the deed, and other circumstances which tend, as a matter of fact, to show the probable execution and loss of such a deed, is admissible as evidence to go to the jury upon the question whether they will presume the existence and loss of the deed." (32 Vt., 183.)

In that case it was a deed recorded in the authorized public records, but this copy is from the possession of claimants, authenticated not by any public officer with authority, and may as well have been certified to by any individual or private citizen. I know of no rule that would warrant the reception of this paper in evidence.

The next question to consider is, whether, under the circumstances and the evidence presented, a grant can be presumed to have been made to Antonio Lucero.

"To maintain a title by secondary evidence," say the court in U. S. *v.* Castro *et al.*, (24 How., p. 350), "the claimant must show that the grant was obtained and made in the manner the law required at some former time, and that it was recorded in the proper public office, to which it may be added that such was undoubtedly the Mexican law."

We repeat again these rules of evidence, because it would seem from the case before us that the board of land commissioners and the circuit court regard *written* documentary evidence produced by a claimant from a private receptacle and proved by oral testimony, as of equal authenticity and entitled to equal respect with the public and recorded documents found in the public archives; but such a rule of evidence is altogether inadmissible. It would make the title to lands depend upon oral testimony and consequently render them insecure and unstable, and expose the public to constant imposition and fraud. Independently, therefore, of the strong presumptions against the authenticity of the paper produced as a grant, it cannot upon principles of law be maintained even if the testimony produced by claimant was worthy of belief." (U. S. *v.* Castro *et al.*, 24 Howard, 346.)

Again in the case of the United States *v.* Polack et al. (1st Hoffman Land cases, 284) the court say: "Where the archives contain no evidence or trace of the existence of a grant, the court will demand the fullest and most satisfactory proofs of possession and occupation during the existence of the former government under a notorious and undisputed claim of title, and clear and indubitable evidence of the genuineness of the grant produced."

In the above case no grant was produced, but an alleged copy recorded in the city recorder's office of San Francisco, and the evidence of the governor that he made the grant was taken, also others who swore to the grant having been made, also to the copy being accurate; possession and occupation were also shown. The court say further:

"The best, if not the only tests of the genuineness of an alleged grant are to be found in the record evidence contained in the archives, and in the fact that the land has been occupied under a notorious claim of title recognized by the former government. Under the decision of the Supreme Court in the case of Frémont the latter of these tests cannot in general be applied, for the non-occupation can usually be excused or accounted for by parol proofs."

These decisions likely represent the early adverse sentiment of the courts to Mexican grants of comparative recent dates, and where a brief occupation only was shown, as the decisions evince a greater liberality in dealing with the questions that arise where long occupation is shown under the old Spanish grants, and their adjudication is based more upon the equities of the claims under the treaty stipulations and the rigorous rules of law governing the admission of evidence in such cases have been somewhat relaxed.

"The non-production of the grant does not necessarily affect the right of the claimant to confirmation where loss of the grant is proven and long and notorious occupation of the land is shown to have existed." (U. S. *v.* Sutter, 21 How., 170; U. S. *v.* Castro, 24 How., 346; 1st Hoffman L. Cas., 125; *ibid.*, 284; U. S. *v.* Estudillo, *ibid.*, 204.) An occupation so long continued (as 20 years) and so notorious, with a claim of ownership so universally recognized, might of itself be deemed sufficient evidence of ownership. (1st Hoffm'n L. Cas., p. 125.)

"Although certain rules upon the subject of the presumption of a grant from possession and lapse of time, have been established, yet the question will still depend in some degree on the particular circumstances of the case." (Herndon *v.* Casino, 7th Texas, 322; Paschal *v.* Perez, *ibid.*, 348.) "Where the defendant and his ancestor possessed and enjoyed a tract of land under a claim of title from 1800 to 1836, and the case was submitted to the judge without a jury, who gave judgment for the defendant, it was held that in such a case a jury might well have presumed an ancient grant (7th Texas, 338)." (Lewis *v.* San Antonio, *ibid.*, 228; Paschal *v.* Perez, *ibid.*, 348; Edwards *v.* James, *Id.*, 372; Robertson *v.* Teal, 9th Texas, 344; Ryan *v.* Jackson, 11 *Id.*, 391; White *v.* Halliday, *Id.*, 606; McGehee *v.* Dwyer, 22d *Id.*, 435; Walker *v.* Hanks, 27 *Id.* 535; Paschal *v.* Dangerfield, 37, *Id.*, 273; Turner *v.* Rogers, 38 *Id.*, 582.)

"A direct grant from the crown, of lands in a royal haven, may be presumed on an unterrupted possession of 60 years (2 Aust., 614; 1 Dow Bar. Ca., 322, 323)."

In presuming a grant to have been made from oral evidence of long occupation and possession I realize that it is by no means a satisfactory basis of founding such presumption, as it is no difficult matter to suborn witnesses to prove such occupation, especially those ignorant of or regardless of the sanctity of an oath. It is, to say the least, a very unsatisfactory method, and imposes upon the adjudicating authority a responsibility greater than most courts care to assume, particularly where the adjustment of title to large tracts of land is involved.

There the parol proofs of long possession are strong, the character of the witnesses beyond suspicion, and their evidence is corroborated by extraneous facts and circumstances, such as would show a clear equity or claim which the Governments of Spain and Mexico would undoubtedly have recognized, it would be the duty of this Government to confirm the claim. Such I conceive to be the character of the claim in this instance; and while I have determined to presume a grant as having been made upon the evidence offered I do so with some misgivings as to the propriety of such presumption, especially where the claimants might obtain documentary evidence of their alleged grant from the archives of Spain or Mexico, without relying upon proofs much less satisfactory. But having presumed a grant in this instance its nature and extent remain to be considered.

The petitioners claim an area covering something like 500 square miles of territory, and extending from the Rio Grande on the east to the top of what is now specifically known ai the Jemez Mountain, northwest of the present pueblo of Jemez, or about 40 miles east and west and from 12 to 15 miles in width. The town which is shown by the testimony to be located in the Cañada de Cochiti, from which it takes its name, lies on the east side of what is now known as the Valles Mountains; these mountains intervene between the settlement of the grantees and what is designated by the witnesses as the Jemez Mountain. It is claimed, but does not appear in evidence, that in years past, and at the time when this grant is alleged to have been made all the mountains in that vicinity, including what is now known as the Valles Mountains, were called the Jamez Mountains, there being a number of spurs and connecting ranges, the Jemez River having its source in these mountains and running southward through them. On the east of the river is what is now called the Valles Mountains, which is quite a high range, and on the west of it, some 6 to 10 miles distant, with broken mesas or table lands intervening, is the Jemez range, now so called.

At the period of the alleged grant the laws authorizing the alienation of the royal domain by grant and composition were among those enacted by the council of the Indies, and are found in Book 3, Tit. 3, Laws 2, 4, and 5: Book 4, Tit. 12, Laws 1 to 21, inclusive; Book 4, Tit. 13, Laws 1; Book 4, Tit. 17, Laws 5 and 8, Recopilacion de Indies (see 2 White's Recop., vol. 2, pp. 38 to 56, inclusive), which are included in the compilation by the commission appointed in 1670, and approved by royal decree of May 18, 1680, under the name and title of Recopilacion de Indias, which embrace the laws in force relative to the disposition of lands in the Spanish American colonies. This work was again revised about the year 1775, in order to embrace intervening orders, decrees, etc., relative to the disposition of lands in the ultra-marine provinces of the Spanish kingdom.

The Recopilacion de Indias is a sort of digest of the royal orders, etc., issued from time to time for the government of the American colonies and to regulate the political, military, and fiscal administration of the Spanish possessions, or rather to supply such particular laws specially applicable to the colonies, which were exceptions to the general and common law of Spain, also in force and embraced in the Nueva Recopilacion which appeared in 1567 and which was superceded by the Novisimo Recopilacion published in 1805.

Under the ancient laws of Spain the crown claimed full dominion of a conquered kingdom, and the lands of such kingdom (among them New Spain, which embraced this Territory) were divided into four classes.

1st. Those granted to Pueblos for their support, called deproprias.

2nd. Those granted by the king to persons for service rendered in conquering the new kingdom, as rewards.

3d. Those sold to individuals for the purpose of supplying the pecuniary necessities of the crown, the 2nd and 3d being called *dominio particular*.

4th. Common vacant and royal lands, or valdios and realengos. These common vacant and royal lands were not granted in fee, but merely the usufruct was ceded for use and occupation, and the quantity was limited to the actual necessities of the grantee, what he was able to use and occupy for pasturing and watering his herds, with the right to cut wood for his use. Nothing was paid for this concession and the grantees were merely tenants at will. (See Law 3, Tit. 8, Book 8, del ordenamiento; Law 10, Tit. 15, Book 2, Recopilacion; Law 2, Tit. 1, Book 3, del ordenamiento; Law 1, Tit. 5, Book 7, Recopilacion; Law 1, Tit. 5, Book 7, Recopilacion.)

The petition of claimants alleges that the grant was made in 1728, and the character and extent of the concession will be estimated under the laws in force at that time, inasmuch as the possession and occupation of the tract is attempted to be shown from that period by oral evidence based on general repute as to time of commencement of the grantee's occupation prior to a time within the personal memory of the witnesses. At that period no large tracts were alienated in fee, and it is not probable that such a large area as that claimed by the petitioners was so granted. It was a custom in those days to give the applicant a usufruct of considerable tracts out of the royal domain for pastural purposes, and small tracts for cultivation and pasture of small herds were granted in fee under Law 1, Tit. 12, Book 4, and Law 5, Tit. 17, Book 4, 2nd White's Recop., pp. 48 and 56. The latter law, which is the more recent of the two, related to royal lands particularly, for which no consideration was paid, and it is therein declared "that pastures, mountains, and waters shall be common in the Indies, to all the inhabitants thereof, present and to come." Law 5, Tit. 3, Book 3, p. 40, 2 White's Recop. authorized grants as rewards, favors, and compensation without apparent limit, but the language of the subsequent law would necessarily prohibit the granting in fee of large tracts of pasture land, and it is my opinion that no such a grant in fee to so large a tract of pasture and wood land can be presumed as having been made at that time in violation of an express statute prohibiting the same at least by implication.

In the case of McMullen *v.* Hodge, reported in 5 Texas, p. 62, the court say: "We may, however, here be permitted to remark, that the concession of a large extent of land for the purposes of pasturage and the raising of cattle was unknown to the Spanish law." "Permission to occupy, or tenancy at will, terminated by the overthrow of the Spanish monarchy, if not sooner."—*Ibid.* "It may well be doubted whether large grants of public lands were ever authorized in any case by the laws of Spain (5 Texas, p. 86)." "The concession of land for pasture of cattle constitutes no more than the usufruct of it (2 White's Recop., 287)."

In the case of the United States *v.* Teshmaker, *et al.*, 22 How., 392, the court say: "Indeed according to the laws of the Indies, the pastures, mountains, and waters in the provinces were made common to all the inhabitants, with liberty to establish their corrals and herdsmen's huts thereon and freely to enjoy the use thereof; and a penalty of 5,000 ounces of gold was imposed on every person who should interrupt this common right."

If a grant is presumed in this case the nature and extent of the same must necessarily be governed by the laws in force at the period at which it is claimed and presumed the concession was made. The fact that the Cañon de San Diego grants, made in 1788 and 1798; Ramon Vigil grant, in 1742; Nerio Antonio Montoya grant, made in 1768, and Los Frijoles grant made in 1780, all of them, in whole or in part, carved out of the tract claimed in the case at bar, and covering the major part of it, is evidence that the succeeding Spanish officials did not recognize the existence of a grant in fee, covering that extensive territory.

Accepting the evidence of a possession so ancient, and existing from a period of time whereof the memory of man runneth not to the contrary, coupled with and strengthened by a prescriptive right, that the Spanish laws and authorities appear to have recognized in some instances (see article 4 Royal Regulation of October 15, 1754, also law 1, Tit. 17, Book 10; 2 White, 155) of very long occupation and possession, I am disposed to approve this claim to the extent of the lands actually occupied and re-

duced to personal uninterrupted use and possession by Antonio Lucero, his heirs and assigns, for the period claimed without conflict with other claimants and within the extent authorized to be granted in fee under law 1, Tit. 12, Book 4, Recop. de Indies, as that appears to be the only law under which it is reasonable to presume the grant was made, if the presumed concession under the claim as presented carries the fee, not merely constructive possession is here meant, for of such as they did not actually occupy and use, there could be no prescriptive right acquired, nor could they under the Spanish laws be presumed to have held more than the unsufruct of such; which usufruct determined and ceased when any portion of that which Lucero held by tenancy at will, was granted to any one else, either in fee or the mere use thereof granted for any purpose.

To rely entirely upon parol proofs as to the extent of the tract actually occupied and used would render its area quite uncertain and difficult to determine. Laws 1 and 15, Tit. 12, and Law 5, Tit. 17 of Book 4, Recopilacion de Indies were in force at the period named, the latter qualifying the former; and in addition to what was authorized to be granted in fee by Law 1, Tit. 12, Law 15, Tit. 12, authorized the concession of the usufruct of a greater area for pastural purposes. If a grant is presumed under Law 15, Tit. 12, and Law 5, Tit. 17, it would amount to nothing more than the presumption of a tendency at the will of the sovereign, which carried no right to a fee in the land, thereby defeating the equities of the claimant, as the usufruct has long since been determined, certainly upon the acquisition of this country by the United States, if not upon the change of sovereignty from Spain to Mexico, and as such a claim of tenancy at will only, it would not fall within the class that this Government would be under obligation to recognize as valid. It was the evident intention of the Spanish Government, under Law 1, Tit. 12, Book 4, above referred to, to concede the fee to small areas of land for cultivation and pasture, a portion of which, although tillable land, was doubtless used for pasture by the individual receiving the allotment or grant. The mountains were valuable for grazing purposes and wood lands, also for the mineral; hence only the usufruct thereof was conceded for a term of years, during the life of the grantee, or at the pleasure of the sovereign, and the conclusion follows that such lands would not have been included in a concession carrying or intending to convey to the grantee the fee, and the presumed grant of lands under the Spanish laws of that period were undoubtedly confined to such as might be adapted to agriculture, with a small area for pastural purposes, although it may also all have been suitable for pasture as well as tillable land; yet it is not probable that this concession extended into and embraced the fee to the mountains (in contravention of the law heretofore quoted) west of the location of the town or settlement of Cañada de Cochiti, where it is claimed Lucero located.

The evidence relative to the boundary calls refers particularly to those named in the copy of the alleged grant document and not to the limits of what was actually reduced to use and possession by Lucero and his heirs, and in no event can its area conflict with other bona fide claims under prior or subsequent concessions, as the fact that such grants were subsequently made of portions of the territory claimed to have been originally granted to Lucero, is evidence that he merely had the usufruct of such regranted premises, if he had any right thereto. Yet as some additional land might have been granted him for pasture as well as for cultivation, under the law at that time, and as the equities of the case appear to justify it, I concede the right to, and approve this claim for so much land as was actually and bona fide used, occupied, and held in the peaceable uninterrupted possession, under claim of title, by Antonio Lucero, his heirs and assigns, under and by virtue of the presumed concession, and by reason of such occupation and possession from time immemorial, and until the change of sovereignty to the United States and thereafter. The extent of the tract so occupied, held, and used, to be clearly shown and established by further evidence to be submitted prior to an official survey thereof, but to be limited and restricted as indicated in this decision.

A transcript in triplicate of all the papers in the case will be transmitted to Congress for its action in the premises.

HENRY M. ATKINSON,
United States Surveyor-General for New Mexico.

UNITED STATES SURVEYOR-GENERAL'S OFFICE,
Santa Fé, New Mex., August 25, 1883.

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48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. DOC. No. 45.

INDIANS OF BLACKFEET AND OTHER AGENCIES.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

An estimate of $50,000 *from the Interior Department to supply deficiency in the appropriation for the support of Indians of the Blackfeet, Crow, Fort Belknap, and Fort Peck Agencies for the current fiscal year.*

DECEMBER 17, 1884.—Referred to the Committee on Appropriations and ordered to be printed.

TREASURY DEPARTMENT,
December 17, 1884.

SIR: I have the honor to transmit herewith, for the consideration of Congress, an estimate received from the Secretary of the Interior to supply a deficiency in the appropriation for the current fiscal year for support of the Indians of the Blackfeet, Crow, Fort Belknap, and Fort Peck Agencies, amounting to $50,000.

Very respectfully,

H. McCULLOCH,
Secretary.

Hon. JOHN G. CARLISLE,
Speaker, House of Representatives.

DEPARTMENT OF THE INTERIOR,
Washington, December 17, 1884.

SIR: I have the honor to request that the item of $50,000 for the support of the Indians of the Blackfeet, Crow, Fort Belknap, and Fort Peck Agencies, included in the estimate of deficiencies for the Indian service for the fiscal year ending June 30, 1885, and forwarded to your Department December 15, may be taken from said estimate and transmitted to Congress at the earliest practicable moment.

The appropriation for this purpose for the present year was insufficient.

This Department instructed the agent of the Blackfeet Indians to exhaust his supplies on the 21st of March, so as to increase the food

issue by three months, trusting to an immediate appropriation by Congress.

Supplies must be sent in by January 15, 1885, or the chances are that they cannot pass over the roads before the middle of June.

Immediate action should be taken or starvation will ensue.

Very respectfully,

M. L. JOSLYN,
Acting Secretary.

The Hon. SECRETARY OF THE TREASURY.

Support of Indians of Blackfeet, Crow, Fort Belknap, and Fort Peck Agencies, being a deficiency for the fiscal year ending June 30, 1885. $50,000

NOTE.—The sum of $100,000 was appropriated for this object by joint resolution of February 8, 1884 (23 Stat., p. 267).

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48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 46.

CONTAGIOUS AND INFECTIOUS DISEASES AMONG DOMESTIC ANIMALS.

LETTER

FROM

THE COMMISSIONER OF AGRICULTURE,

TRANSMITTING

A list of persons employed and statement of expenditures and of means adopted for the suppression of contagious and infectious diseases among domestic animals.

DECEMBER 18, 1884.—Referred to the Committee on Agriculture and ordered to be printed.

DEPARTMENT OF AGRICULTURE,
Washington, D. C., December 17, 1884.

SIR: In accordance with the provisions of section 11 of "An act for the establishment of a Bureau of Animal Industry," &c., I herewith transmit "a list of the names of all persons employed, an itemized statement of all expenditures under this act, and full particulars of the means adopted and carried into effect for the suppression of contagious, infectious, or communicable diseases among domestic animals."

I have the honor to be, respectfully, your obedient servant,

GEO. B. LORING,
Commissioner of Agriculture.

Hon. J. G. CARLISLE,
Speaker House of Representatives.

REPORT.

Immediately after the approval of the "Act for the establishment of a Bureau of Animal Industry," &c., the Bureau was organized, and the work provided for was commenced.

The disease made most prominent in the law is the contagious pleuro-pneumonia of cattle, and as at that time there was considerable doubt among members of Congress and State and local authorities as to the existence of this disease in the United States, the first work to be done was evidently to make those investigations into the existence and nature of the diseases of animals in this country which were specially authorized in the law.

The governors and local authorities of the States where pleuro-pneumonia was believed to exist were requested to co-operate with this Bureau and to grant its inspectors authority to enter upon the premises of the citizens of those States in order to make the necessary inspections.

In the State of New York the inspectors of the Bureau were authorized to act as inspectors of the State board of health, and they also received the cordial assistance and co-operation of the boards of health of New York City, Brooklyn, and the other local boards of the district in the vicinity of Brooklyn. With this assistance the inspectors have been able to make a very thorough and complete investigation of the most populous districts of the State of New York, where pleuro-pneumonia was supposed to exist. Some of the more sparsely settled sections of Long Island, where this disease has been reported, have not been inspected, owing to a lack of time and the limited number of employés allowed by the law. The New Jersey authorities have also co-operated cheerfully in investigating the condition of cattle in that State, but owing to the magnitude of the work in New York but a comparatively small portion of New Jersey has been gone over.

The governor of Pennsylvania and his special agent employed for the extermination of pleuro-pneumonia have expressed their willingness to co-operate with the Bureau in making an investigation, but no work has yet been done in that State. Correspondence with the governor of Maryland justified the belief that we shall have his cheerful co-operation to the full extent of the State law, but the details have not yet been arranged. The Commissioners of the District of Columbia were requested to give our inspectors authority to make an inspection of the cattle in Washington and vicinity, but such authority has not yet been granted.

The board of health has co-operated with the inspectors of the Bureau, however, and a very satisfactory inspection has been made. The following table gives the result of these inspections to date:

Location.	Herds examined.	Cattle examined.	Herds infected.	Cattle affected with pleuro-pneumonia.
New York City	1,147	6,365	16	36
Long Island	1,463	10,072	119	325
Staten Island	555	3,857	12	13
New Jersey	349	4,381	42	81
District of Columbia	422	2,482	27	30
New York slaughter-houses	.....	408	.....	41
New York offal dock	.....	82	.....	22
Jersey City abattoir (40 visits	.....	.....	.....	13
Total	3,936	27,647	216	561

REINSPECTION.

Brooklyn	60	868	60	100
Jersey City	4	39	4	11
Total	64	907	64	111

It may be remarked here that while all of these States have signified a willingness to co-operate in this investigation, there has been some objection to such an inspection upon the ground that more cases of disease would be found than the States could dispose of with their limited

appropriations, and consequently it would cause much embarrassment to the State authorities. It has also been argued with much feeling that the publication of the number of cases existing in these States would create unnecessary alarm, and interfere greatly with the commerce of the country, and particularly of the infected sections, without accomplishing a beneficial result, since sufficient provision had not been made for exterminating the disease. This inspection, moreover, does not give a correct idea of the number of cases which occur in a specified time in the district examined. There can be no doubt that a number of cases reported actually existed at the time the inspection was made, but if a tour had been made a month later we should probably have found as many at this new inspection, a large part of which would have been new cases. Again, many dairymen in all the large cities, where the disease exists, have become very expert in the management of their cattle in order to avoid loss. The cows are kept in good condition for the butcher, and as soon as the first symptoms of the disease are seen the animals are sent to the slaughter-house.

The cases which were found by our inspectors were consequently only those which for some reason had not been or could not be disposed of in this way.

Considering these facts and that probably not more than one-half of the cattle in the infected district have been examined, it would be a moderate estimate to suppose that 1,500 cattle in this infected district are annually affected with pleuro-pneumonia.

The exact number, however, can never be determined until measures are adopted by which the movement of cattle from infected stables can be effectually controlled.

There have been a certain number of stables, though comparatively few in number, to which our inspectors couldnot gain admittance. It is probable that all of these can be reached either by the special laws relating to this disease or by those for the protection of the public health, but it has not been deemed best to consume time in contesting such cases while this preliminary investigation was being made. There has also been much difficulty in making the inspections, owing to the fact that many of the cattle were on pasture when our inspectors called to see them, and in a large number of cases, the owners absolutely refused to bring them up for inspection, and, as it is well known an inspection in the field for pleuro-pneumonia is of very little service. Generally a second visit was made to these places at a time when the cows were in the stable for milking, and in this way nearly all have been examined, but more time has been consumed than would otherwise have been necessary.

During the month of August contagious pleuro-pneumonia was found in a number of herds in the State of Illinois. The governor and State veterinarian were notified and the infected farms were at once quarantined by them, and the diseased animals slaughtered under the State law covering such cases. A number of cattle from one of these herds were shipped to Cynthiana, Ky., and placed among a large number of other animals (about two hundred and fifty). The disease has since broken out in this herd, and, according to the latest information received, twelve have died. The governor of Kentucky was promptly notified, and the owners of the cattle were informed that any shipments from their herd would render them liable to the penalties imposed in section 7 of the act establishing this Bureau. There is no special law in Kentucky applicable to the suppression of this disease, and the gen-

eral laws relating to nuisances are not regarded as sufficiently specific in their provisions to secure the condemnation of the herd.

The disease was carried to Illinois by cattle from an infected herd at Troy, Ohio, and other cattle were shipped from this herd to Dayton, Ohio, where the plague again appeared. The governor of Ohio, and the State Board of Agriculture, were notified, but there appeared to be no law in Ohio by which such cases can be reached. Mr. Dye, the owner of the herd at Troy, allowed me to slaughter seven of his animals which had been sick and had made an apparent recovery, but which were still so much diseased as to be dangerous to other animals. He hopes to receive some compensation from the State legislature at its next session. At Dayton there are still five animals with badly-diseased lungs, but as we have learned of no new cases for more than six months, it is hoped that it will extend no farther. An inspector of the Bureau has recently been sent to watch the infected herds in Ohio and Kentucky, to examine into the condition of the cattle in the country near them, and to report any violation of the law which may occur.

The disease appears to have been carried to Ohio by cattle purchased in the vicinity of Baltimore. About 627 animals were exposed to the contagion in the States west of the Alleghanies, and 105 cases of disease have occurred We have learned of no extension of the plague to fresh herds since it was discovered and the proper measures adopted to prevent the movement of cattle from the infected farms.

This outbreak furnishes incontestible evidence of the contagiousness of the pleuro pneumonia of this country. It appeared in Mr. Dye's herd after the introduction of animals from the infected district of the East. It was carried from there to Dayton, Ohio, where 13 cases occurred, and to Virginia, Ill., where it was distributed by animals sold at a public sale to Geneva, Peoria, Springfield, Jacksonville, Danvers, and Rushville. From Geneva it was carried, by animals sold, to Elmhurst, Sterling, and Saint Charles, in Illinois, and at Cynthiana, in Kentucky. No cases of this disease have been discovered at any places in the West that are not clearly connected by the movement of cattle with an infected herd, with the single exception of the Troy cattle, among which were taken a number of animals from unknown herds, gathered up in the vicinity of Baltimore, where we know the disease exists. Many cases of disease have been investigated at various places in Ohio, Indiana, Illinois, Iowa, Missouri, and Tennessee, in most of which the symptoms of lung affection had been reported to us, but in none of these cases, with the exception of those noted above, have we been able to find the symptoms and post mortem appearances which indicate contagious pleuro-pneumonia. Suspicion has in this way been removed from many valuable herds, and what at one time threatened to be a serious damage to commerce by the panic created has been shorn of its terrors, by showing how few herds had been contaminated, and that the disease would not be allowed to spread to others.

The experiments instituted to test the contagiousness of pleuro-pneumonia as it exists in this country have been continued to the present time.

Before the establishment of the Bureau, fifteen animals had been exposed to various cows affected with the disease, which had been found in the dairy stables about Washington, but no positive cases of disease resulted from this exposure, though one cow contracted a severe cough without other signs of lung disease.

Fearing that the animals used in this experiment had already been exposed to the disease before they were purchased for the experiment

station, and had in this way become insusceptible, four cows were brought from West Virginia in the month of March, and were exposed to three sick cows from Washington stables. All of these cows contracted acute lung disease, which was observed with two about the middle of April and with the two others during the first half of May.

One was very severely affected, and would have died had she not been slaughtered. The remaining three were improving at the time of slaughter, and would have recovered. Three showed the characteristic lesions of pleuro-pneumonia; one presented the lesions of pleurisy without pneumonia. In September a stable was built on Barren Island, near New York, a point selected because of its isolation, and because there were but few cattle on the island that would be exposed to danger. No disease of this nature had previously affected the cattle that were kept there. Eighteen cows and thirteen calves were purchased and placed in the stable, which was surrounded with a large yard, into which they could be driven for exercise. Sixteen of the cows were from Canada, and were selected for their healthfulness and fine appearance. The calves were the offspring of these cows.

Five cows from Brooklyn affected with pleuro-pneumonia were placed in the same stable. Between that time and the present twelve cows and five calves have contracted pleuro-pneumonia, as reported by Dr. L. W. McLean, who is in charge of the stable. I saw three of these cows slaughtered, October 29, and can testify that they were in the last stage of pleuro-pneumonia, both lungs being affected in all. A large extent of lung tissue was involved, with marked appearance, effusion into the pleural cavities, and extensive adhesions to the ribs and diaphragm—characters which are relied upon the world over to distinguish contagious pleuro-pneumonia. These experiments, consequently, demonstrate incontestably the contagious nature of the pleuro-pneumonia of this country, and appear to establish the fact that it is equally virulent with the pleuro-pneumonia of Europe.

No regulations could be adopted the present year in regard to the Southern fever, or so-called Texas fever of cattle, because it was too late in the season before the Bureau was organized.

The investigations necessary to define the district from which cattle are dangerous have been going on during the year, and it is hoped that before spring we shall know the exact limits of the section which is permanently infected with this disease. Such knowledge seems to be absolutely essential before any efficient regulations can be made for controlling Texas fever and preventing the losses which annually occur from it. The railroad and stock-yard companies were requested to clean and disinfect cars, and to set apart certain yards for the exclusive use of the dangerous cattle; but as we had no power to enforce such regulations, nor even men to supervise the work, but few companies heeded the request, and in most cases the measures were so imperfectly carried out as to be practically without result.

Losses from swine plague during the past six months have been enormous and very widespread. The investigations of this disease are being continued, but the great demands made upon our time in the investigation of the cattle disease, referred to above, have prevented us from reaching any practical results, and have not allowed us to properly test the many proposed remedies which have been brought to our attention.

In addition to the veterinary work referred to above, five employés of the Bureau have been engaged in collecting statistics and other information in regard to the magnitude of the animal industry, the breeds

employed in its various branches in different sections of the country, their comparative value in these different localities, the peculiarities and needs of the industry, the losses from various causes, and other facts necessary for intelligent conclusions in regard to its present condition and prospects.

All of these reports are not yet to hand, but they are nearly ready, and will be printed in full in the first annual report of the Bureau of Animal Industry, which is now in preparation.

I append an itemized list of expenditures from July 1 to November 30, with which appear the names of all persons employed.

At no one time have there been more than twenty persons employed in addition to the chief, the two agents, and the clerk provided for in the act.

Date.	Name.	Object.	Amount.
1884.			
July 1	D. E. Salmon	Salary for June	$247 25
7	do	Expenses to Albany and New York City	62 05
12	J. S. Redman	Eight pigs	24 00
15	W. J. Yoste	Fifteen days' salary, July	24 46
16	G. Hartig & Sons	Fly-nets	3 50
16	William B. E. Miller	Salary and expenses, June 15 to 30, inclusive	193 25
25	J. B. Grinnell	Salary and expenses for June	236 40
25	George R. Vernon	Salary and expenses, June 14 to 30, inclusive	111 83
31	Thomas J. Keane	Ten pigs	27 50
31	D. E. Salmon	Expenses to New York	53 05
31	do	Salary for July	252 70
31	Miles Fuller	do	126 40
31	W. H. Rose	do	134 80
31	Theobold Smith	do	134 80
31	William Alexander	do	60 60
31	B. F. Yoste	Salary for 16 days, July	26 09
31	S. E. Sinkfield	Salary for July	46 30
Aug. 1	William Rose	Seven days' salary, July	56 00
1	T. M. Spilman	Three pigs and coop	6 25
2	H. J. Ruppert	Rent of veterinary station, July	40 00
6	R. C. Saunders, jr	Salary and expenses, July	182 60
9	Z. D. Gilman	Dry plates, &c	24 50
11	Estate of G. M. Wight	Cylinder desk	40 00
12	Henry M. Taylor	Salary and expenses, July 10 to 31, inclusive	300 40
13	Scoville Manufacturing Company	Revolving camera, &c	66 12
19	H. W. Rowland	Salary and expenses, July 1 to 16	137 70
19	George R. Vernon	Salary and expenses, July	197 85
19	William B. E. Miller	do	294 52
27	James Bradley	Eight pigs	20 00
29	W. H. Rose	Expenses to Virginia	7 50
30	J. M. Wine	File-cases	143 00
30	John C. Parker	Stationery	67 00
31	D. E Salmon	Salary for August	252 70
31	Miles Fuller	do	126 40
31	W. H. Rose	do	134 80
31	Theobold Smith	do	134 80
31	William Alexander	do	60 60
31	B. F. Yoste	do	50 50
31	S. E. Sinkfield	do	46 30
Sept. 1	D. E. Salmon	Expenses	188 56
2	Charles Fischer	Repairing surgical case	3 50
5	R. C. Saunders, jr	Salary and expenses, August	191 75
6	H. J. Ruppert	Rent of station, August	40 00
10	J. C. Parker	Envelopes and stamps	23 50
13	H. M. Taylor	Salary and expenses, August	365 50
15	C., N O. St. & S. W. Ry. Co	Tickets	12 50
15	Patrick McCabe	Sixteen head of cattle	1,080 00
16	Ch. B. Michener	Salary and expenses, August	165 00
16	J. B. Grinnell	do	298 95
16	do	Salary and expenses, July	233 05
16	M. R Trombower	Salary and expenses, August	310 70
16	William Rose	do	144 00
16	John Boyd	do	104 00
16	James H. Payne	Salary and expenses, July and August	490 75
16	William B. E. Miller	Expenses	47 50
17	H. W. Rowland	Salary and expenses, August	235 06
17	J. W. Hawk	do	281 32
20	W. H. Rose	Expenses in Virginia	16 50
20	Thomas J. Herr	Salary and expenses, July 24 to September 1	290 80
20	George R. Vernon	Salary and expenses, August	352 00
20	J. H. Fullenwider	do	350 90
20	Robert Farley, jr	Salary, July 17 to 31, inclusive	312 00
22	Z. D. Gilman	Jars, &c	29 47
23	William B. E. Miller	Salary and expenses, August	318 50
26	S. H. Gage	Section knife	5 00
26	Anna Miman	One cow	20 00
26	Thomas F. White	Two cows	100 00
26	Julia Gans	Three cows	135 00
30	Ch. B. Michener	Salary and expenses, September	116 70
30	George R. Vernon	do	356 00
30	Robert Farley, jr	do	247 25
30	William Rose	do	162 70
30	D. E. Salmon	Salary, September	244 60
30	Miles Fuller	do	122 20
30	W. H. Rose	do	130 40
30	Theobold Smith	do	130 40
30	William Alexander	do	58 80
30	B. F. Yoste	do	49 00
30	S. E. Sinkfield	do	44 90
30	William B. E. Miller	Salary and expenses, September	342 85
Oct. 3	W. H. Rose	Expenses to Maryland and Virginia	8 30
4	R. C. Sanders, jr	Salary and expenses, September	183 67
4	H. J. Ruppert	Rent of veterinary station	40 00

Date.	Name.	Object.	Amount.
1884.			
Oct. 6	Thomas J. Herr	Salary and expenses, September	$237 65
7	M. R. Trombower	do	333 5
7	J. H. Fullenwider	do	341 90
7	G. M. Wight's estate	Desks and chairs	92 00
9	W. H. Wray	Salary and expenses	361 95
9	Henry M. Taylor	Salary and expenses, September	397 50
9	H. W. Rowland	do	229 99
9	P. White's Sons	Building stable, &c	577 95
10	J. W. Hawk	Salary and expenses, September	225 95
11	B. Westermann & Co	Books	164 05
11	J. B. Grinnell	Salary and expenses, September	260 85
13	W. M. Galt & Co	Feed	423 99
13	James H. Payne	Salary and expenses, September	260 00
13	Catherine Mooney	One cow	22 50
16	William B. E. Miller	Hay, grain, &c	111 40
20	Western Union Telegraph Co	Messages	23 11
22	D. E. Salmon	Expenses	250 20
22	do	Expenses in laboratory	3 48
23	Western Union Telegraph Co	Messages	30 45
27	R. C. Saunders, jr	Salary and expenses, October	116 81
29	J. Blake White	Salary and expenses, July 17 to September 30, 1884.	249 57
31	D. E. Salmon	Salary, October	252 70
31	W. H. Rose	do	134 80
31	Theobold Smith	do	134 80
31	Miles Fuller	do	126 40
31	William Alexander	do	60 60
31	B. F. Yoste	do	50 50
31	S. E. Sinkfield	do	46 30
Nov. 1	J. Blake White	Salary and stamps, October	101 20
1	William Rose	do	164 40
1	Scoville Manufacturing Company	Group lens	67 50
3	George R. Vernon	Salary and expenses, October	374 45
3	Z. D. Gilman	Microscopic slides, &c	9 35
4	Lachlan McLean	Salary and expenses, September 25 to October 31.	313 60
4	Ch. B. Michener	Salary and expenses, October	178 00
4	James H. Payne	do	270 00
4	J. H. Fullenwider	do	352 35
4	Thomas J. Herr	do	258 60
4	William B. E. Miller	do	405 30
5	W. H. Wray	do	197 75
6	D. E. Salmon	Expenses to New York	34 10
6	R. C. Saunders, jr	Salary and expenses, October	60 86
6	M. R. Trombower	do	285 02
7	H. W. Rowland	do	269 03
7	J. W. Hawk	do	297 55
8	H. J. Ruppert	Rent of veterinary station, October	40 00
8	M. Sexton	One cow	10 00
8	Andrew C. Cooke	Four calves	40 00
12	Endres & Lang	Ocean freight	13 85
14	H M. Taylor	Salary and expenses, October	437 25
15	Seligman Pifferling	One cow	25 00
15	B. F. Hansom & Co	Copying paper on cattle industry	5 00
17	Mackellar, Smith & Jordan	Type	65
17	L. S. Bowman & Co	Feed for cattle	254 42
19	John A. Baker	Gazetteer, &c	34 50
21	J. B. Grinnell	Salary and expenses	235 50
22	W. H. Rose	Expenses in Maryland	6 40
24	B. Westermann & Co	Books	21 82
24	do	do	6 96
28	Lachlan McLean	Salary and expenses, November	245 00
29	M. W. Wood	One cow	50 00
29	Robert Leith & Sons	Brass funnel and box	10 50
30	D. E. Salmon	Salary, November	244 60
30	W. H. Rose	do	130 40
30	Theobold Smith	do	130 40
30	Miles Fuller	do	122 20
30	William Alexander	do	58 80
30	B. F. Yoste	do	49 00
30	S. E. Sinkfield	do	44 90
30	R. C. Saunders, jr	Salary and expenses, November	120 80
	Total		24, 036 10

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 47.

RANK OF COMMODORES IN THE NAVY.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES

TRANSMITTING

A communication from the Secretary of the Navy relative to rank of commodores in the Navy.

DECEMBER 18, 1884.—Referred to the Committee on Naval Affairs and ordered to be printed.

EXECUTIVE MANSION, *December* 16, 1884.

In compliance with the following resolution, adopted by the House on the 10th instant, viz:

Resolved, That the President be requested to furnish this House as early as convenient with the necessary information showing the authority of law for which certain commodores of the Navy have been given the rank of acting rear-admirals when, as is alleged, no vacancy existed to justify such action."

I transmit herewith a communication from the Secretary of the Navy containing the information called for by the resolution.

CHESTER A. ARTHUR.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

NAVY DEPARTMENT,
Washington, December 15, 1884.

SIR: In reply to the resolution of the House of Representatives adopted December 10, 1884, I have the honor to state that the commodores in the Navy commanding the United States forces on the Asiatic, Pacific, and North Atlantic stations have been given the rank of acting rear-admiral under authority of law first given by act of Congress of December 21, 1861 (12 Statutes at Large, page 329), as follows:

SEC. 4. The President of the United States shall have the authority to select any officer from the grades of captain or commander in the Navy, and assign him to the command of a squadron with the rank and title of a "flag-officer."

In pursuance of the authority thus given, many appointments of acting rear-admirals were made, among them the following:

Commander S. P. Lee, September 2, 1862, North Atlantic blockading squadron.

Commodore Charles H. Bell, September 15, 1862, Pacific squadron.

Commodore Charles Wilkes, September 15, 1862, James River flotilla.

Commodore J. L. Lardner, September 15, 1862, East Gulf blockading squadron.

Commodore Charles H. Davis, September 15, 1862, Mississippi squadron.

Commander David D. Porter, October 1, 1862, Mississippi squadron.

Commodore T. Bailey, November 4, 1862, East Gulf squadron.

Commodore C. K. Stribling, September 12, 1864, East Gulf squadron.

Commodore G. F. Pearson, September 12, 1864, Pacific station.

Commodore H. K. Thatcher, January 24, 1865, West Gulf blockading squadron.

Commodore William Radford, April 28, 1865, North Atlantic squadron.

Commodore James S. Palmer, December 31, 1865, West India squadron.

Commodore S. W. Gordon, May 16, 1865, Brazil squadron.

Commodore H. H. Bell, July 31, 1865, East India squadron.

The following are copies of some of the appointments given to acting rear-admirals:

NAVY DEPARTMENT,
October 1, 1862.

SIR: Under authority of an act to promote the efficiency of the Navy, approved December 21, 1861, section 4, you are selected to command the Mississippi squadron.

You will therefore proceed to Cairo, Ill., by the 12th instant, and report to Acting Rear-Admiral Chas. H. Davis, who will transfer the command of that squadron to yourself, when you will immediately hoist your flag as acting rear-admiral. This appointment to continue in force whilst you are in command of that squadron.

On your way to Cairo the Department desires you to inspect the gun-boats building at Pittsburgh, Cincinnati, Mound City, and Saint Louis.

I am, respectfully,

GIDEON WELLES.

Commander DAVID D. PORTER,
Appointed to Command Mississippi Squadron, Washington, D. C.

NAVY DEPARTMENT,
November 4, 1862.

SIR: You are hereby detached from the command of the naval station at Sacket's Harbor, N. Y., and you will proceed with all convenient dispatch to Key West, Fla., and on your arrival relieve Acting Rear-Admiral Lardner from the command of the Eastern Gulf blockading squadron. After assuming command you will regard yourself as acting rear-admiral, to continue whilst in command of the squadron.

Acting Rear-Admiral Lardner has been instructed to transfer to you all matters pertaining to his command.

I am, respectfully,

GIDEON WELLES.

Commodore THEODORUS BAILEY, U. S. N.,
Sacket's Harbor, N. Y.

The Revised Statutes, in section 1434, while continuing the authority conferred by the law of December 21, 1861, enlarges it so as to expressly include all officers "not below the grade of commander," and also omits the word "a" before "flag-officer," but it is not thought that this omission makes any change in meaning.

Accompanying the recent orders giving the temporary rank of acting rear-admiral to certain commodores while in command of squadrons have been transmitted letters stating that no right is conferred to claim additional pay or emoluments beyond those pertaining to the grade of commodore.

The action of the Navy Department now called in question has been taken, not from a regard for individuals, but only upon consideration of national interests. The reduction by Congress of the number of rear-

admirals to six has made it necessary to intrust the command of some of the squadrons to commodores. It was important to exercise the authority of the statute, and to confer upon each of these officers the rank and title of rear-admiral, in order that they might meet on terms of equality the admirals commanding the squadrons of other nations.

It is desirable that Congress should immediately act upon the recommendation in the annual report of this Department of December 1, and abolish the grade of commodore and authorize a reorganization, which shall include six vice-admirals and ten rear-admirals.

I have the honor to be, sir, very respectfully,

WM. E. CHANDLER,
Secretary of the Navy.

To the PRESIDENT.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 48.

EXTRA POLICEMEN.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

Estimate from the Commissioners of the District of Columbia of an appropriation for extra policemen at the dedication of the Washington Monument and inauguration ceremonies.

DECEMBER 19, 1884.—Referred to the Committee on Appropriations and ordered to be printed.

TREASURY DEPARTMENT,
December 17, 1884.

SIR: I have the honor to transmit herewith an estimate of appropriation received from the Commissioners of the District of Columbia, for $9,300 to pay an additional force of policemen, and for their insignia of office and equipments, during the ceremonies attending the dedication of the Washington Monument and inauguration of the next President.

The estimate is forwarded for the consideration of Congress, and one-half of such appropriation as may be made should be payable out of the revenues of the District, as in the case of a former appropriation of like character, made by the act of March 1, 1881 (21 Stat., p. 374).

Very respectfully,

H. MCCULLOCH,
Secretary.

Hon. JOHN G. CARLISLE,
Speaker House of Representatives.

OFFICE OF THE COMMISSIONERS,
DISTRICT OF COLUMBIA,
Washington, December 13, 1884.

SIR: The Commissioners have the honor to transmit herewith an estimate of the amount they deem necessary to pay the additional force of policemen that will be required to preserve order and protect property during the dedication ceremonies of the monument to the name and memory of George Washington, and the proceedings which shall

attend the inauguration of the next President. The Commissioners respectfully urge that this appropriation shall be made special and be acted upon without delay.

Very respectfully,

J. B. EDMONDS,
President.

Hon. HUGH MCCULLOCH,
Secretary of the Treasury.

For pay of 300 additional policemen for special duty for fifteen days, from February 20 to March 6, inclusive, 1885, at $2 per day, $9,000; for their insignia of office and equipments, $300; in all, $9,300; one-half to be paid out of the Treasury of the United States, and one-half out of the revenues of the District of Columbia.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 49.

PUBLIC BUILDING AT HARRISONBURG, VA.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

IN RESPONSE TO

A resolution of the House of the 17th instant, calling for information in relation to the purchase of a site and erection of a public building at Harrisonburg, Va.

DECEMBER 19, 1884.—Referred to the Committee on Public Buildings and Grounds and ordered to be printed.

TREASURY DEPARTMENT,
December 18, 1884.

SIR: I have the honor to acknowledge the receipt of a copy of House resolution of December 17, 1884, directing the Secretary of the Treasury to report certain information as to action taken under the act approved July 7, 1882, authorizing the purchase of a site and the erection thereon of a public building at Harrisonburg, Va.

In response thereto I beg leave to submit the following answers, viz:

First. Ground has been purchased as a site for the said building.

Second. The price paid for the said ground was $12,000, and previous to its payment the honorable Attorney-General certified to the validity of the title, and the State of Virginia had ceded to the United States exclusive jurisdiction over the property to be purchased for this purpose.

Third. The following statement will show the amount of money expended, and how and for what purpose expended, viz:

Limit of cost of site and building			$50,000 00
Appropriated			50,000 00
Expended on account of site:			
For advertising	$8 00		
For expenses of commission	3 00		
For plat	25 00		
For record fees	18 60		
For legal expenses	300 00		
For purchase money	12,000 00		
		$12,354 60	
Expended for draftsman's services		255 00	
Expended at the building to November 30, 1884		1,145 35	
			13,754 95
Balance			36,245 05

Fourth. The estimated cost of the said building, including site, is $50,000, being the amount already appropriated.

Attention is respectfully called to that portion of the report of the Supervising Architect of this Department which refers to this building.

Very respectfully,

H. McCULLOCH,
Secretary.

Hon. JOHN G. CARLISLE,
Speaker of the House of Representatives.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. DOC. No. 50.

YELLOWSTONE NATIONAL PARK.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

An estimate from the Interior Department of an appropriation for the protection and improvement of the Yellowstone National Park for the fiscal year ending June 30, 1886.

DECEMBER 19, 1884.—Referred to the Committee on Appropriations and ordered to be printed.

TREASURY DEPARTMENT,
December 18, 1884.

SIR: I have the honor to forward herewith, for the consideration of Congress, an estimate of appropriation received from the Secretary of the Interior for the protection and improvement of the Yellowstone National Park during the fiscal year ending June 30, 1886, amounting to $40,000.

Very respectfully,

H. MCCULLOCH,
Secretary.

Hon. JOHN G. CARLISLE,
Speaker House of Representatives.

Protection and improvement of Yellowstone National Park.

Salary of superintendent	$2,000
Salaries of ten assistant superintendents	9,000
Construction of suitable roads and bridges in the Park, to be expended under the direction of an officer of the Engineer Corps of the Army to be designated by the Secretary of War	29,000
Total	40,000

Being for the service of the fiscal year ending June 30, 1886.

NOTE.—The appropriation for the above object for the fiscal year ending June 30, 1885, was made by the suudry civil act of July 7, 1884 (23 Stat., p. 211).

O

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. Doc. No. 51.

PRINTING AND BINDING FOR THE STATE DEPARTMENT.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

INCLOSING

Letter from the Secretary of State asking an appropriation of $5,000 *to supply deficiency in the allotment for printing and binding for the State Department for the current fiscal year.*

DECEMBER 19, 1884.—Referred to the Committee on Appropriations and ordered to be printed.

TREASURY DEPARTMENT,
December 18, 1884.

SIR: I have the honor to forward herewith, for the consideration of Congress, copy of a communication from the Secretary of State relating to the early necessity of an appropriation of $5,000, to supply a deficiency in the allotment for printing and binding for the Department of State for the current fiscal year.

Very respectfully,

H. McCULLOCH,
Secretary.

Hon. JOHN G. CARLISLE,
Speaker, House of Representatives.

DEPARTMENT OF STATE,
Washington, December 16, 1884.

SIR: The amount allotted to the Department of State for printing and binding for the fiscal year ending June 30, 1885, is entirely exhausted. The amount for the year ending June 30, 1884, was $15,000, while that alloted for this year was only $10,800.

I have, therefore, the honor to request that, under the act passed July 7, 1884, you recommend to Congress the immediate appropriation

of the sum of $5,000 for the printing and binding necessary to this Department until June 30, 1885. The allotment being completely exhausted and a considerable amount of printing being still required, you will see the necessity for speedy action in the matter.

I have the honor to be, sir, your obedient servant,

FRED'K T. FRELINGHUYSEN,
Secretary.

Hon. HUGH MCCULLOCH,
Secretary of the Treasury.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. DOC. No. 52.

EXPENDITURES ON ACCOUNT OF COAST AND GEODETIC SURVEY.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

INCLOSING

Statement of expenditures on account of the United States Coast and Geodetic Survey for the fiscal year ending June 30, 1884

DECEMBER 19, 1884.—Referred to the Committee on Expenditures in the Treasury Department and ordered to be printed.

TREASURY DEPARTMENT, *December* 18, 1884.

SIR: In compliance with section 264 of the Revised Statutes, I have the honor to forward herewith a statement of expenditures made on account of the United States Coast and Geodetic Survey for the fiscal year ending June 30, 1884.

Very respectfully,

H. McCULLOCH,
Secretary.

Hon. JOHN G. CARLISLE,
Speaker of the House of Representatives.

UNITED STATES COAST AND GEODETIC SURVEY OFFICE,
Washington, December 13, 1884.

SIR: In conformity with section 264 of the Revised Statutes, I transmit herewith a statement of expenditures made on account of the Coast and Gedoetic Survey for the fiscal year ending June 30, 1884.

Very respectfully,

J. E. HILGARD,
Superintendent.

Hon. SECRETARY OF THE TREASURY.

STATEMENT OF THE EXPENDITURES OF THE UNITED STATES COAST AND GEODETIC SURVEY FOR THE FISCAL YEAR ENDING JUNE 30, 1884.

[Prepared pursuant to act approved March 3, 1853.]

SALARIES.

Name and office.	Compensation.	Time employed.
SUPERINTENDENT.		
J. E. Hilgard	$6,000 00	1 year.
ASSISTANT IN CHARGE OF OFFICE.		
C. O. Boutelle*	3,840 00	Do.
ASSISTANTS.		
Richard D. Cutts†	1,788 39	5 months, 13 days.
George Davidson	3,960 00	1 year.
Henry Mitchell	3,480 00	Do.
Charles A. Schott	3,118 00	Do.
Henry L. Whiting	1,514 16	7 months.
Charles S. Peirce	2,935 00	1 year.
George W. Dean	2,870 00	Do.
Aug. F. Rodgers	2,799 00	Do.
George A. Fairfield	2,331 00	Do.
A. T. Mosman	2,331 00	Do.
James S. Lawson	2,322 00	Do.
E. Hergesheimer	2,298 00	Do.
W. H. Dennis	2,286 00	Do.
Cleveland Rockwell	2,292 00	Do.
Charles Hosmer	2,180 00	Do.
Edward Goodfellow	2,150 00	Do.
John W. Donn	2,154 00	Do.
Charles M. Bache	2,154 00	Do.
R. M. Bache	2,154 00	Do.
C. H. Boyd	2,144 00	Do.
A. W. Longfellow	2,070 00	Do.
William Eimbeck	2,030 00	Do.
Herbert G. Ogden	2,000 00	Do.
Louis A. Sengteller	1,925 00	Do.
F. H. Gerdes	1,988 88	11 months, 28 days.
C. T. Iardella	1,900 00	1 year.
J. S. Bradford	1,900 00	Do.
R. E. Halter	1,900 00	Do.
Gershom Bradford	1,850 00	Do.
O. H. Tittmann	1,850 00	Do.
Spencer C. McCorkle	1,840 00	Do.
B. A. Colonna	1,775 00	Do.
J. J. Gilbert	1,775 00	Do.
Stehman Forney	1,725 00	Do.
Edwin Smith	1,725 00	Do.
F. Walley Perkins	1,750 00	Do.
Henry L. Marindin	1,750 00	Do.
F. D. Granger	1,700 00	Do.
William H. Dall	1,650 00	Do.
Andrew Braid	1,625 00	Do.
H. W. Blair	1,585 00	Do.
E. F. Dickins	1,525 00	Do.
Eugene Ellicott	1,500 00	Do.
D. B. Wainwright	1,500 00	Do.
Joseph Hergesheimer	1,500 00	Do.
J. F. Pratt‖	1,425 00	Do.
SUB-ASSISTANTS.		
C. H. Sinclair	1,350 00	Do.
John B. Weir	1,350 00	Do.
W. Irving Vinal	1,325 00	Do.
James B. Baylor	1,300 00	Do.
W. C. Hodgkins	1,200 00	Do.
Francis H. Parsons	1,200 00	Do.
C. H. Van Orden	1,200 00	Do.
E. D. Preston	594 35	6 months, 15 days.
R. A. Marr	1,000 00	1 year.
AIDS.		
Isaac Winston	900 00	Do.
P. A. Welker	900 00	Do.
Fremont Morse	900 00	Do.
John E. McGrath	900 00	Do.

* From January 1, 1884.

† Assistant in charge of office to December 13, 1883.

STATEMENT OF EXPENDITURES OF THE UNITED STATES COAST AND GEODETIC SURVEY, &c.—Continued.

SALARIES—Continued.

Name and office.	Compensation.	Time employed.
AIDS—Continued.		
Carlisle Terry, jr	$870 00	1 year.
Thomas P. Borden	810 00	Do.
George F. Bird	810 00	Do.
E. L. Taney	810 00	Do.
OFFICE OF SUPERINTENDENT.		
W. W. Cooper, civil expert	1,800 00	Do.
W. B. Chilton, clerk	1,500 00	Do.
Charles Over, messenger	823 50	Do.
OFFICE OF DISBURSING AGENT.		
William B. Morgan, disbursing agent	2,500 00	Do.
John W. Parsons, accountant	1,600 00	Do.
W. A. Herbert, accountant	900 00	6 months.
V. J. Fagin, examiner	633 34	Do.
OFFICE OF HYDROGRAPHIC INSPECTOR.		
H. Lindenkohl, draughtsman	2,100 00	1 year.
E. Willenbucher, draughtsman	2,000 00	Do.
F. C. Donn, draughtsman	1,200 00	Do.
W. C. Willenbrecher, draughtsman	1,200 00	Do.
E. H. Wyvill, writer	900 00	Do.
William Savoy, messenger	640 50	Do.
OFFICE OF COAST PILOT.		
John R. Barker, artist	995 69	7 months, 28 days.
James H. Barker, draughtsman	322 00	3 months, 14 days.
John C. Barr, compiler	1,200 00	1 year.
C. L. Walker, writer	720 00	Do.
OFFICE OF ASSISTANT IN CHARGE.		
Samuel Hein, librarian	1,800 00	Do.
G. A. Stewart, keeper of archives	579 17	4 months, 19 days.
W. B. French, clerk	1,500 00	1 year.
W. A. Herbert, clerk	750 00	6 months.
S. C. Ayers, writer	720 00	1 year.
K. Patterson, writer	720 00	Do.
F. Cadel, buoy colorer	720 00	Do.
J. B. Tyrell, buoy colorer	495 00	9 months, 18 days.
T. A. Sullivan, printer's help	626 00	1 year.
COMPUTING DIVISION.		
M. H. Doolittle, computer	1,850 00	Do.
J. G. Porter, computer	1,600 00	Do.
A. S. Christie, computer	1,330 00	Do.
H. Farquhar, computer	1,260 00	Do.
C. H. Kummell, computer	1,230 00	Do.
Alexander Ziwet, computer	1,000 00	Do.
P. R. Stansbury, writer	720 00	Do.
J. W. Reed, laborer	593 25	Do.
DIVISION OF TIDES.		
R. S. Avery, chief computer	2,000 00	Do.
L. P. Shidy, computer	1,150 00	Do.
L. J. Ferrel, computer	540 00	Do.
DRAWING DIVISION.		
W. T. Bright, chief of division	2,050 00	Do.
A. Lindenkohl, draughtsman	2,350 00	Do.
Charles Junken, draughtsman	1,850 00	Do.
L. Karcher, draughtsman	1,160 00	8 months, 23 days.
T. J. O'Sullivan, draughtsman	1,400 00	1 year.
R. H. Fowler, draughtsman	1,400 00	Do.
P. Erichsen, draughtsman	1,400 00	Do.
K. J. Sommer, draughtsman	890 56	7 months, 19 days.
E. Molkow, draughtsman	1,330 25	1 year.

STATEMENT OF EXPENDITURES OF THE UNITED STATES COAST AND GEODETIC SURVEY, &c.—Continued.

SALARIES—Continued.

Name and office.	Compensation.	Time employed.
DRAWING DIVISION—Continued.		
A. B. Graham, draughtsman	$1,133 66	10 months, 24 days.
R. T. Bassett, map mounter	1,017 25	1 year.
R. M. Harvey, writer	840 00	Do.
E. J. Enthoffer, draughtsman	608 00	Do.
Peter Page, messenger	469 50	Do.
M. Lauxman, laborer	313 00	Do.
C. Abert, writer	240 00	4 months.
ENGRAVING DIVISION.		
E. A. Maedel, engraver	2,060 00	1 year.
H. M. Knight, engraver	2,000 07	Do.
William A. Thompson, engraver	1,956 25	Do.
John G. Thompson, engraver	1,799 75	Do.
A. Petersen, engraver	1,799 75	Do.
A. Sengteller, engraver	203 23	1 month, 11 days.
E. H. Sipe, engraver	1,486 75	1 year.
William H. Davis, engraver	1,408 50	Do.
T. Wasserbach, engraver	1,486 75	Do.
A. C. Ruebsam, engraver	939 00	Do.
J. Enthoffer, engraver	2,400 00	Do.
H. C. Evans, engraver	2,100 00	Do.
R. F. Bartle, engraver	1,800 00	Do.
F. Courtenay, engraver	1,200 00	Do.
John H. Smoot, recorder	1,400 00	Do.
A. Zumbrock, electrotypist	2,000 00	Do.
P. Vierbuchen, mechanician	588 75	6 months.
Werner Suess, mechanician	663 00	Do.
F. Moore, copper plate printer	1,721 50	1 year.
D. N. Hoover, copper plate printer	1,330 25	Do.
James Beck, copper plate printer	1,173 75	Do.
J. L. Smith, copper plate printer	1,238 25	Do.
Frank Over, helper to electrotypist	546 00	6 months.
William Young, messenger	786 90	1 year.
Charles Jones, messenger	414 00	6 months.
J. R. Gibson, buoy colorer	387 80	9 months, 7 days.
A. A. Yeatman, writer	234 00	4 months, 13 days.
S. D. Benner, recorder	120 00	2 months.
F. W. Benner, engraver	58 38	1 month.
MISCELLANEOUS DIVISION.		
M. W. Wines, chief of division	2,000 00	1 year.
Hugo Eichholtz, chart room	1,173 75	Do.
A. Yeatman, carpenter	655 00	5 months.
H. O. French, carpenter	780 00	6 months.
George F. Cox, carpenter	704 25	1 year.
George W. Clarvoe, carpenter	469 50	Do.
N. Y. Cavitt, janitor	1,200 00	Do.
William H. Butler, chief messenger	878 40	Do.
A. C. Whitney, watchman	896 70	Do.
H. W. Huber, watchman	896 70	Do.
William M. Long, watchman	896 70	Do.
Hazzard McCoy, driver	823 50	Do.
A. Richardson, packer and folder	732 00	Do.
Richard Waters, fireman	732 00	Do.
Horace Dyer, printer's help	641 65	Do.
William West, laborer	482 50	Do.
S. B. Harvie, copyist	720 00	Do.
M. Thomas, copyist	720 00	Do.
George Newman, laborer	461 60	Do.
S. E. Flynn, charwoman	313 00	Do.
INSTRUMENT SHOP.		
G. N. Saegmuller, chief mechanician	2,000 00	Do.
John Clark, mechanician	1,565 00	Do.
Werner Suess, mechanician	667 25	6 months.
P. Vierbuchen, mechanician	585 00	Do.
E. Eshleman, mechanician	1,252 00	1 year.
Charles Jones, packer and folder	409 50	6 months.
Frank Over, helper	549 50	Do.
Louis A. Fischer, mechanician	782 50	1 year.
S. A. Kearney, mechanician	469 50	Do.
Sandy Bruce, messenger	732 00	Do.

STATEMENT OF EXPENDITURES OF THE UNITED STATES COAST AND GEODETIC SURVEY, &c.—Continued.

SALARIES—Continued.

Name and office.	Compensation.	Time employed.
SAN FRANCISCO SUBOFFICE.		
F. Westdahl, draughtsman	$1,800 00	1 year.
Charles B. Hill, clerk	885 00	Do.
Vicente Denis, janitor	839 13	Do.
Total	246,970 71	

Appropriation	$253,450 00
Expenditures	246,970 71
Balance	6,497 29

PARTY EXPENSES.

On what account.	1883. Quarter ending Sept. 30.	1883. Quarter ending Dec. 31.	1884. Quarter ending March 31.	1884. Quarter ending June 30.	Total for year.
Coast of Maine	$6,076 25	$1,798 88	.....	$924 46	$8,799 59
Channels between Nantucket and Monomoy	1,312 76	178 13	.....	.....	1,490 89
Long Island Sound	10,447 01	4,624 57	$596 21	2,329 28	17,997 07
Delaware Bay	2,309 94	959 63	.....	.....	3,269 57
Coast of New Jersey	2,331 22	1,001 84	91 00	105 27	3,529 33
Chesapeake Bay and North Carolina Sounds	.....	349 54	453 10	1,350 89	2,153 53
East Coast of Florida	1,980 58	1,906 43	1,381 00	1,020 68	6,288 69
West Coast of Florida, from San Carlos Entrance	146 09	1,111 51	242 40	1,499 44	2,999 44
West Coast of Florida, from Anclote Keys	.....	950 56	2,719 07	1,122 45	4,792 08
Louisiana, from Barataria Bay westward	9 45	405 80	1,664 26	1,419 63	3,499 14
Lonisiana, from Calcasieu Pass eastward	.....	196 92	2,835 86	1,467 03	4,499 81
Coast of Texas	41 93	861 51	1,183 58	153 51	2,240 53
Off-shore Soundings and Current Observations	2,508 25	873 61	982 79	4,632 26	5,996 91
Geographical Positions (longitudes)	1,765 88	960 35	.....	22 50	2,748 73
Triangulation connecting Coast and Lakes	2,700 00	.....	.....	.....	2,700 00
Triangulation from Atlanta to Mobile	.....	.....	300 00	1,949 47	2,249 47
Leveling, from Gulf to Transcontinental Line	.....	.....	931 53	867 09	1,798 62
Tide Observations, Atlantic and Gulf coasts	489 43	482 45	376 22	443 15	1,791 25
Magnetic Observations, Atlantic and Gulf coasts	90 00	142 50	404 79	1,694 17	2,231 46
Gravity Experiments	1,055 67	572 21	789 89	741 98	3,159 75
Coast Pilot Hydrographic Examinations	469 36	322 48	1,163 40	1,044 09	2,999 33
General Map of the United States	1,040 97	185 25	623 24	580 54	2,430 00
Topography, Coast of California	863 58	1,725 72	2,619 99	2,888 13	8,097 42
Triangulation, Coast of California	2,573 74	5,910 16	5,104 10	2,319 77	15,907 77
Hydrography, Coast of California	1,961 64	1,413 47	2,115 40	1,508 58	6,999 09
Coast of Oregon	5,016 15	2,374 34	163 90	1,271 24	8,825 63
Washington Territory, Fuca Straits	.....	.....	.....	4,570 72	4.570 72
Puget Sound	1,642 45	986 77	80 00	2,148 67	4,857 89
Coast of Alaska	3,114 64	1,609 92	1,786 20	653 35	7,164 11
Tide Observations, Pacific coast	251 75	246 20	345 30	930 22	1,773 47
Magnetic Observations, Pacific coast	808 28	825 84	911 40	993 15	3,538 67
Gravity Observations, Pacific coast	1,750 25	453 05	60 00	.....	2.263 30
Objects not hereinbefore named	3,315 95	2,966 25	1,758 53	2,334 40	10,375 13
Totals	56,073 22	36,395 89	31,683 16	39,986 12	164,138 39

Appropriation		$165,000 00
Expenditures	$164,138 39	
Pacific Railroad certificates referred to accounting officers for settlement	638 14	
		164,776 53
Balance		223 47

TRANSCONTINENTAL WORK.

Quarter ending September 30, 1883	$17,582 86
Quarter ending December 31, 1883	8,208 56
Quarter ending March 31, 1884	858 25
Quarter ending June 30, 1884	3,186 33
Total	29,836 00
Appropriation	30,000 00
Expenditures $29,836 00	
Pacific Railroad certificates referred to accounting officers for settlement 161 00	
	29,997 00
Balance	3 00

POINTS FOR STATE SURVEYS.

Quarter ending September 30, 1883	$11,694 34
Quarter ending December 31, 1883	3,285 02
Quarter ending March 31, 1884	342 33
Quarter ending June 30, 1884	671 67
Total	15,993 36
Appropriation	16,000 00
Expenditures	15,993 36
Balance	6 64

COAST SURVEY STEAMER FOR PACIFIC COAST.

Quarter ending September 30, 1883	$465 28
Quarter ending December 31, 1883	40,258 68
Quarter ending March 31, 1884	9,049 85
Quarter ending June 30, 1884	45,932 23
Total	95,706 04
Appropriation	100,000 00
Expenditures	95,706 04
Balance	4,293 96

REPAIRS OF VESSELS, COAST SURVEY.

Steamer Hassler	$2,092 55
Steamer Blake	7,871 94
Steamer Gedney	241 69
Steamer McArthur	910 80
Steamer Endeavor	425 68
Steamer Arago	460 24
Steamer Barataria	1,193 15
Steamer Bache	1,325 32
Steamer Hitchcock	51 24
Schooner Yukon	1,163 84
Schooner Silliman	30 68
Schooner Drift	1,098 74
Schooner Eagre	2,098 86
Schooner Scoresby	347 09
Schooner Palinurus	180 89
Schooner Ready	511 40
Schooner Quick	519 70
Schooner Earnest	207 11
Schooner Bache	27 00
Sloop Steadfast	75 79
Barge Beauty	1,575 10
Launch Sagadahoc	355 95
Launch Fuca	599 47

REPAIRS OF VESSELS, COAST SURVEY—Continued.

Launches Nos. 4, 9, and 107, and fittings		$617 00
One steam-launch		2,750 00
Total		26,731 23
Appropriation		27,000 00
Expenditures		26,731 23
Balance		268 77

OBSERVATIONS, ECLIPSE OF THE SUN.

Appropriation		$5,000 00
Expenditures	$4,924 76	
Pacific Railroad certificates referred to accounting officers for settlement; being in part payment for same	75 24	
		5,000 00

PUBLISHING THE OBSERVATIONS AND RESULTS OF THE COAST AND GEODETIC SURVEY.

[List showing the number and names of persons employed.]

Name and office.	Compensation.	Time employed.
E. H. Courtenay, computer	$1,850 00	1 year.
C. D. Gedney, computer	1,200 00	Do.
V. J. Fagin, computer	540 00	6 months.
C. B. Turnbull, computer	720 00	1 year.
M. L. Oliver, writer	720 00	Do.
C. Abert, computer	480 00	8 months.
C. L. Barton, writer	180 00	3 months.
Total	5,690 00	

Appropriation		$6,000 00
Expenditures—pay of those employed	$5,690 00	
Expenditures—preparation of MS., &c	296 37	
		5,986 37
Balance		13 63

GENERAL EXPENSES.

On what account.	1883.		1884.		Total for year.
	Quarter ending September 30.	Quarter ending December 31.	Quarter ending March 31.	Quarter ending June 30.	
Rent of buildings for offices, work-rooms, and work-shops	$2,625 00	$2,625 00	$2,625 00	$2,625 00	$10,500 00
Rent of fire-proof building	1,500 00	1,500 00	1,500 00	1,500 00	6,000 00
New instruments and books	4,551 58	775 60	701 50	415 24	6,443 92
Drawing division and map mounting, instrument shop, carpenter shop, and allowances to assistants in charge of office details	2,593 85	2,284 29	1,870 76	1,199 33	7,948 23
Chart paper, printing ink, copper plates, engravers' supplies, and electrotyping supplies	3,408 07	1,946 98	855 04	2,386 78	8,596 87
Extra engraving	728 17	242 80	15 00	.....	985 97
Photolithographing	1,542 60	882 00	275 00	2,756 40	5,456 00
Stationery, transportation of instruments, office furniture and office wagon	1,647 91	767 45	1,462 46	1,970 24	5,848 06
Fuel, gas, telegrams, extra labor, and washing	1,643 71	517 93	515 86	728 51	3,406 01
Miscellaneous, contingencies, &c	797 55	388 13	318 73	1,383 42	2,887 83
Totals	21,038 44	11,930 18	10,139 35	14,964 92	58,072 89

Appropriation		$57,840 00
Received from Engineer's Office, War Department, for electrotyping		850 40
Received from Hydrographic Office, Navy Department, for electrotyping		649 48
Total		59,339 88
Expenditures		58,072 89
Balance		1,266 99

SALARIES, OFFICE OF STANDARD WEIGHTS AND MEASURES.

[List showing number and names of those employed.]

Name and office.	Compensation.	Time employed.
James J. Clark, adjuster	$1,565 00	1 year.
E. B. Lefavour, verifier	1,252 00	Do.
D. C. Chapman, mechanician	1,252 00	Do.
M. E. Nesbitt, recorder	720 00	Do.
John Warren, watchman	720 00	Do.
John H. Brown, laborer	469 50	Do.
Total	5,978 50	

Appropriation	$5,978 50
Expenditures	5,978 50

CONTINGENT EXPENSES, OFFICE OF STANDARD WEIGHTS AND MEASURES.

Quarter ending September 30, 1883	$322 45
Quarter ending December 31, 1883	120 95
Quarter ending March 31, 1884	394 03
Quarter ending June 30, 1884	356 89
Total	1,194 32
Appropriation	1,200 00
Expenditures	1,194 32
Balance	5 68

Recapitulation of the appropriations, expenditures, and balances of the Coast and Geodetic Survey for the fiscal year ending June 30, 1884.

On what account.	Appropriation.	Expenditures.	Balances.
Salaries	$253,450 00	$246,970 71	$6,479 29
Party expenses	165,000 00	164,776 53	223 47
Transcontinental work	30,000 00	29,997 00	3 00
Points for State surveys	16,000 00	15,993 36	6 64
Coast Survey steamer for Pacific coast	100,000 00	95,706 04	4,293 96
Repairs of vessels	27,000 00	26,731 23	268 77
Observations eclipse of the sun	5,000 00	5,000 00	.....
Publishing observations	6,000 00	5,986 37	13 63
General expenses*	*59,339 88	58,072 89	1,266 99
Salaries, weights and measures	5,978 50	5,978 50	.....
Contingencies, weights and measures	1,200 00	1,194 32	5 68
Totals	668,968 38	656,406 95	12,561 43

*Including $1,499.88 received for electrotyping.

Total appropriations	$668,968 38
Total expenditures	656,406 95
Total balances	12,561 43

I certify the foregoing to be an exhibit of the expenditures of the United States Coast and Geodetic Survey for the fiscal year ending June 30, 1884, as shown by the books of this office.

WM. B. MORGAN,
Disbursing Agent, U. S. Coast and Geodetic Survey.

WASHINGTON, D. C., *November* 1, 1884.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 53.

IMPROVEMENT OF HELL GATE, NEW YORK.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING,

In response to a resolution of the House, a report of the Chief of Engineers relative to the use of the appropriation for the improvement of Hell Gate, New York Harbor.

DECEMBER 19, 1884.—Referred to the Committee on Rivers and Harbors and ordered to be printed.

WAR DEPARTMENT,
Washington City, December 19, 1884.

The Secretary of War has the honor to transmit to the House of Representatives a report dated the 18th instant, from the Chief of Engineers, relating to the use of the appropriation for the improvement of Hell Gate, New York Harbor, the same being transmitted in response to House resolution of the 12th instant, as follows:

Resolved, That the Secretary of War be directed to inform this House whether any part of the amount appropriated in the river and harbor act of July 5, 1884, for removing the reef at Hell Gate, New York, has been used for a different purpose, and, if so, by whom and under what authority.

ROBERT T. LINCOLN,
Secretary of War.

The SPEAKER *of the House of Representatives.*

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., December 18, 1884.

SIR: I have the honor to acknowledge the reference to this office, on the 13th instant, of the resolution of the House of Representatives, dated the 12th instant, directing the Secretary of War "to inform this House whether any part of the amount appropriated in the river and harbor act of July 5, 1884, for removing the reef at Hell Gate, New York, has been used for a different purpose, and if so, by whom and under what authority," and to return the same with the following re-

port of Lieut. Col. Walter McFarland, Corps of Engineers, to whom it was referred, which it is hoped will be satisfactory:

No part of the "amount appropriated in the river and harbor act of July 5, 1884, for removing the reef at Hell Gate, New York," has been used for any other purpose.

I have examined all the vouchers that have been paid since the 1st of July last, on account of "removing obstructions in East River and Hell Gate," and none have been charged against the appropriation of July 5, 1884, for Hell Gate, except those belonging to it, namely, those which cover expenditures for labor and material applied to the removal of Flood Rock.

Very respectfully, your obedient servant,

JOHN NEWTON,
Chief of Engineers, Brig. and Bvt. Maj. Gen.

Hon. ROBERT T. LINCOLN,
Secretary of War.

O

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. Doc. No. 55.

CLAIMS ALLOWED BY ACCOUNTING OFFICERS OF THE TREASURY.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

A list of claims allowed by the several accounting officers of the Treasury, amounting to $215,951.12, *remaining unprovided for.*

JANUARY 5, 1885.—Referred to the Committee on Appropriations and ordered to be printed.

TREASURY DEPARTMENT,
January 3, 1885.

SIR: I have the honor to transmit herewith, for the consideration of Congress, a list of certain claims allowed by the several accounting officers of the Treasury Department, under appropriations, the balances of which have been exhausted or carried to the surplus fund under the provisions of section 5 of the act of June 20, 1874 (18 Stat., 110), amounting to $215,951.12.

These claims were transmitted to Congress at its last session on January 25 and April 26, 1884, and embraced in House Ex. Docs. Nos. 67 and 144, first session, Forty-eighth Congress, but were not provided for.

Very respectfully,

H. MCCULLOCH,
Secretary.

Hon. JOHN G. CARLISLE,
Speaker, House of Representatives.

CLAIMS.

Amounts allowed by the accounting officers of the Treasury Department.

ALLOWED BY THE FIRST COMPTROLLER, UNDER SECTION 4 OF THE ACT OF JUNE 14, 1878.

No. of certificate or claim.	Name of claimant.	Appropriation from which payable.	Fiscal year in which the expenditure was incurred.	Amount.	Total.	Remarks.
	TREASURY DEPARTMENT.					
	MISCELLANEOUS.					
234613	Union Pacific Railroad Company.....	Vaults, safes, and locks for public buildings, 1881 and prior years.	1881.....	$1,228 57		
236671	Chicago, Rock Island and Pacific Railway Company.	.....do	1881.....	48 35		
	Total Treasury Department	.....	.....	.....	$1,276 92	
	DEPARTMENT OF THE INTERIOR.					
234558	Western Union Telegraph Company....	Contingent expenses, office of Secretary of the Interior, 1881 and prior years.	1881.....	.....	12 98	
	PUBLIC LANDS SERVICE.					
237186	Atchison, Topeka and Santa Fé Railroad Company.	Geological Survey, 1881 and prior years ..	1881.....	26 41		
236797	Chicago, Rock Island and Pacific Railway Company.	.....do	1880 and 1881..	16 49		
234569	Union Pacific Railroad Company.....	.....do	1881.....	02		
234567	.....do	.....do	1880.....	3 25		
					46 17	
39123	McBroome & Taylor.....	Surveying private land claims in New Mexico, 1881 and prior years.	1881.....	.....	208 53	
36796	George S. Smith.....	Contingent expenses, office of surveyor-general of Nebraska and Iowa, 1881 and prior years.	1881.....	.....	77 80	
36780	Malachi Martin.....	Contingent expenses, office of surveyor-general of Florida, 1881 and prior years.	1881	.....	95	
39405	Albert Johnson.....	Contingent expenses, office of surveyor-general of Colorado, 1881 and prior years.	1881.....	201 66		
37862	..... do	..... do	1881.....	274 65		
					476 31	
	Total Department of the Interior..	.....	.....	.....	822 74	

	DEPARTMENT OF JUSTICE—JUDICIAL.					
78531	R. M. Douglas	Fees and expenses of marshals United States courts, 1881 and prior years.	1881	1,017 71		Balance due to him as marshal.
75993	O. P. Fitzsimons	do	1881	2,157 35		Do.
76029	do	do	1881	9 60		Do.
84106	A. B. Norton	do	1881	2,934 34		Do.
					6,119 00	
78377	J. S. Call, western district North Carolina.	Fees of witnesses United States courts, 1881 and prior years.	1878	7 50		The witnesses named are in the western district of North Carolina and the western district of Virginia. They were not paid by the marshals for want of funds, as they state, and most of them sold their claims. The accounting officers now hold that without the sanction of Congress the purchasers cannot be recognized as assignees, because of the provisions of section 3477, Revised Statutes. As Congress has heretofore authorized payment to purchasers in such cases, some of the above claims are reported in favor of such assignees and submitted for consideration
78352	A. E. Holton, western district North Carolina.	do	1877	11 70		
78400	H. S. Harkens, western district North Carolina.	do	1876	22 75		
83543	Miller and Lawrence, western district North Carolina.	do	1879	2 80		
83538	do	do	1879	9 10		
84325	Charles E. Graham, western district North Carolina.	do	1878	10 70		
84327	A. B. Gillespie, western district North Carolina.	do	1880	8 00		
84332	N. T. Stewart, western district North Carolina.	do	1878	17 80		
84334	S. J. Ginnings, western district North Carolina.	do	1879	4 40		
83990	R. J. Woolwine, western district Virginia.	do	1881	12 30		
84008	J. S. Yeatman, western district Virginia.	do	1879 to 1881	332 00		
84013	R. H. Nicholas, western district Virginia	do	1881	23 00		
84015	Fleming & Brother, western district Virginia.	do	1880	37 30		
83855	John G. Watts, United States marshal	do	1881	33 10		Balance due to him as marshal.
					532 45	
84331	F. M. Whiten	Support of prisoners United States courts, 1881 and prior years.	1877		130 00	
	Total Department of Justice, judicial.				6,781 45	

RECAPITULATION OF CLAIMS ALLOWED BY THE FIRST COMPTROLLER.

Treasury Department:			
Vaults, safes, and locks for public buildings, 1881 and prior years			$1,276 92
Interior Department:			
Contingent expenses, office of Secretary of the Interior, 1881 and prior years		$12 98	
Public land service as follows:			
Geological Survey, 1881 and prior years	$46 17		
Surveying private land claims in New Mexico, 1881 and prior years	208 53		
Contingent expenses, office of surveyor-general of Nebraska and Iowa, 1881 and prior years	77 80		
Contingent expenses, office of surveyor-general of Florida, 1881 and prior years	95		
Contingent expenses, office of surveyor-general of Colorado, 1881 and prior years	476 31		
		809 76	
			822 74
Department of Justice, judicial:			
Fees and expenses of marshals, 1881 and prior years		6,119 00	
Fees of witnesses United States courts, 1881 and prior years		532 45	
Support of prisoners United States courts, 1881 and prior years		130 00	
			6,781 45
Total			8,881 11

ALLOWED BY THE SECOND AUDITOR AND THE SECOND COMPTROLLER, UNDER SECTION 4, ACT OF JUNE 14, 1878.

No. of certificate or claim.	Name of claimant.	Appropriation from which payable.	Fiscal year in which the expenditure was incurred.	Amount.	Total.	Remarks.
	WAR DEPARTMENT.					
	CLAIMS.					
3940	James J. Bryant	Contingencies of the Army, 1881 and prior years.	1862		$144 00	In surplus fund. Services as scout and guide under Gen. George Crook, between October, 1861, and May, 1862.
3855	Jackson Enyeart	Draft and substitute fund, 1871 and prior years.	1864		110 00	In surplus fund. Presenting two veteran and four new accepted recruits to the provost-marshal, 17th district of Pennsylvania, February 20, 1864.
19544	James L. Sims, Alabama Volunteers	Pay of volunteers (Mexican war), 1871 and prior years.	1846	$4 50		In surplus fund. Arrears of pay.
22625	Philip Volkmar or Falkmar, Texas Volunteers.	....do		53 09		Do.
					57 59	
22095	John H. Scott, First California Cavalry.	Traveling expenses of California and Nevada volunteers prior to July 1, 1881 (act of March 2, 1867, 14 Stats., 480).	1865		192 37	Traveling expenses on discharge.
4500	Joseph Rosier, South Carolina Volunteers.	Preventing and suppressing Indian hostilities, 1871 and prior years (act of July 2, 1836, 5 Stats., 65).	1836	10 25		In surplus fund. Arrears of pay.
4501	Micajah Simmons, South Carolina Volunteers.	....do	1836	8 81		Do.
					19 06	
	Total				523 02	

RECAPITULATION OF WAR DEPARTMENT CLAIMS ALLOWED BY THE SECOND AUDITOR AND THE SECOND COMPTROLLER.

Contingencies of the Army, 1881 and prior years	$144 00
Draft and substitute fund, 1871 and prior years	110 00
Pay of volunteers (Mexican war), 1871 and prior years	57 59
Traveling expenses of California and Nevada volunteers, prior to July 1, 1881	192 37
Preventing and suppressing Indian hostilities, 1871 and prior years	19 06
Total	523 02

Amounts allowed by the accounting officers of the Treasury Department—Continued.

ALLOWED BY THE THIRD AUDITOR AND THE SECOND COMPTROLLER, UNDER SECTION 4, ACT OF JUNE 14, 1878.

No. of certificate or claim.	No. of settlement.	Name of claimant.	Appropriation from which payable.	Fiscal year in which the expenditure was incurred.	Amount.	Total.	Remarks.
		WAR DEPARTMENT.					
		CLAIMS.					
		REGULAR SUPPLIES.					
55742	1707	T. J. Adams	Regular supplies, Quartermaster's Department, 1881 and prior years. (Sec. 1133, Rev. Stats.)	1865	$22 00		
73706	1709	Arthur Barnett	do	1862	27 00		
53395	1710	Edward Pond	do	1863	6 40		
74768	1955	Robert Noble	do	1878	35 00		
50156	2324	George S. Kinchelow	do	1863	30 00		
63929	2338	J. J. Burch, administrator of Wilson Ritter, deceased.	do	1863	128 60		
52526	2337	Jane Williams	do	1863	22 50		
(*)	369	S. B. M. Young, captain Eighth Cavalry	do	1877	48 52		
7044	2394	Saint Peter's Catholic Mission	do	1850 to 1855	200 00		
						$520 02	
		INCIDENTAL EXPENSES.					
(*)	253	John G. Leefe, lieutenant Nineteenth Infantry.	Incidental expenses, Quartermaster's Department, 1881 and prior years. (Sec. 1133, Rev. Stats.)	1877 and prior years.	20		
74175	1776	Mrs. Jennie Timpany, administratrix of Robert Timpany, deceased.	do	1878	247 20		
(†)	397	Daniel H. Brush, lieutenant Seventeenth Infantry.	do	1880	2 80		
65614	2031	Isaac Worrell	do	1863 and 1864	15 86		
47148	2033	Peter Robinson	do	1865	11 40		
73479	2035	William Kent	do	1863	12 40		
(*)	658	Henry B. Osgood, lieutenant Third Artillery.	do	1877 and prior years.	1 75		
60536	2139	Kendall and Smith, A. H. Wilder holder and owner.	do	1880	15 00		
(†)	781	Jacob R. Pierce, lieutenant Twenty-fourth Infantry.	do	1880	2 36		
						308 97	
		TRANSPORTATION OF THE ARMY.					
64190	7079	Burlington and Missouri River Railroad in Nebraska.	Army transportation, 1881 and prior years (section 1133, Revised Statutes).	1879	94 40		

63719	7095	Hot Springs Railroad Company.	....do	1879	8 56		
68984	7113	James M. Scott	....do	1865	240 00		
58677	7124	R. G. Irvine	....do	1865	117 48		
64150	7159	Atchison, Topeka and Santa Fé Railroad Company.	....do	1879	215 91		
64367	7183	Chicago, Saint Louis and New Orleans Railroad Company.	....do	1877	1 37		
62227	7206‡	Randolph Barton, trustee of the Powhatan Steamboat Company (steamer George Peabody.)	....do	1862 and 1863	19,175 00		
63282	7220	Nathaniel S. Greer	....do	1862	55 31		
57243	7252	William Morning	....do	1864	51 00		
64445	7269	Atchison, Topeka and Santa Fé Railroad Company.	....do	1879	44 61		
64551	7338	Florida line of steamers, Ravenel & Co., agents.	....do	1879	2 61		
64565	7362	Atcheson Richey, deceased; J. H. Ricnie and N. S. Agnew, administrators.	....do	1864	4 00		
64454	7363	John S. Oller	....do	1863	6 60		
61256	7367	Meador and Morris, Mrs. M. L. Eddins, holder and owner.	....do	1870	42 90		
62170	7376	Daniel Shea	....do	1870	105 20		
64810	7418	A. Sexton	....do	1874 and 1875	56 00		
61614	7419	William S. Kindall	....do	1864	102 49		
64840	7520	Cincinnati Southern Railway Company	....do	1879	38		
42070	8805	New York; New Haven and Hartford Railroad Company, now known as New York and New Haven Railroad Company	....do	1866 and 1870	$11 36		
64451	7286	Western and Atlantic Railroad Company.	....do	1876	40 98		
65178	9255	Hot Springs Railroad Company	....do	1879	5 58		
65275	9321	Charles La Meare	....do	1880	3 50		
64995	9329	James Brown	....do	1864	21 00		
61784	9006	Pensacola Railroad, owned and operated by Louisville and Nashville Railroad Co.	....do	1873	189 71		
65194	9618	J. P. Austin	....do	1863	18 25	.....	See list "Subsistence of the Army."
65406	9646	Louisville and Cincinnati United States Mail Line, C. E. Poindexter, agent.	....do	1879	1 72		
65645	9771	Chicago, Saint Louis and New Orleans Railroad Company.	....do	1874	53 31		
(*)	8935	Charles G. Penney, lieutenant Sixth Infantry, A. A. Q. M.	....do	1877 and prior years.	2 00	.....	Quartermaster's account, balance on account. See list "Clothing and equipment."
65073	9812	William Phillips	....do	1864	190 00		
66078	9983	Missouri Pacific Railroad Company	....do	1875	1,498 77		
64782	8774	Denver and Rio Grande Railway Company	....do	1881	11,769 20		
65223	9328	Hot Springs Railroad Company	....do	1881	48 73		
61803	9485	Atchison, Topeka and Santa Fé Railroad Company.	....do	1881	9 00		
62589	9615	C. A. Broadwater	....do	1881	1,165 71		
64081} 64082}	9647	John A. McLean	....do	1881	306 06		

* Quartermaster's account. † Quartermaster's settlement. ‡ Supplemental settlement, only by Second Comptroller.

Amounts allowed by the accounting officers of the Treasury Department—Continued.

ALLOWED BY THE THIRD AUDITOR AND THE SECOND COMPTROLLER, UNDER SECTION 4, ACT OF JUNE 14, 1878—Continued.

No. of certificate or claim.	No. of settlement.	Name of claimant.	Appropriation from which payable.	Fiscal year in which the expenditure was incurred.	Amount.	Total.	Remarks.
		WAR DEPARTMENT—Continued.					
		CLAIMS—continued.					
65521	9659	Joseph Albright	Army transportation, 1881 and prior years (section 1133, Revised Statutes).	1881	$140 00		
65525	9685	Denver and Rio Grande Railway Company.	do	1881	662 90		
65619	9706	Inland and Seaboard Coasting Company	do	1881	6 39		
64785	9741	Missouri Pacific Railway Company	do	1881	50 53		
64760	9742	do	do	1881	444 36		
65316	9775	Chicago, Milwaukee and Saint Paul Railway Company.	do	1881	244 56		
65718	9777	Atchison, Topeka and Santa Fé Railroad Company.	do	1881	27 69		
65713	9779	do	do	1881	1,446 34		
65859	9884	Bismarck, Yates and Sully Stage Line, H. S. Parkin, proprietor.	do	1881	15 00		
65887	9907	J. R. Brown	do	1881	5 50		
65905	9908	Kansas City, Fort Scott and Gulf Railroad Company.	do	1881	298 85		
66076	9975	Chicago, Burlington and Quincy Railroad Company.	do	1881	32 97		
63240	9999	David Roberts, deceased; Isaac S. and Charles W. Roberts, administrators.	do	1864	54 00		See list "Incidental Expenses."
62685	4	Archibald McCaleb	do	1864	30 00		
(*)	8563	Ordnance Department	do	1881	13 97		Quartermaster's account due Ordnance Department.
67936	91	Kansas City, Lawrence and Southern Kansas Railroad Company.	do	1881	8 30		
60439	104	P. L. Gipling	do	1879	122 24		
67935	105	Kansas City, Lawrence and Southern Kansas Railroad Company.	do	1880	31		
64932	123	Frank Peak	do	1865	26 60		
73350	153	Bogert & Morgan	do	1881	161 03		
73342	128	Small & Putnam	do	1881	13 57		
65090	146	W. H. McLaughlin, captain Eighteenth Infantry.	do	1868	74 30		
63281	152	New York and Baltimore Transportation Line.	do	1863	1,400 00		

65882	161	Amasa C. Hall, deceased; Edward Ray and John Brewster, trustees.	do	1863	440 00		
63181	162	New Haven Steamboat Company	do	1863	5,200 00		
65421	174	Andrew J. Richardson, deceased; Elizabeth P. Richardson, administratrix.	do	1863	800 00		
66270	175	Charles Coblens, deceased; James A. Gary and Sally Coblens, executors.	do	1863	1,500 00		
65734	176	Russell Sturges, deceased; Appleton Sturgis, administrator.	do	1862	600 00		
73387	180	James Egan, deceased; Mary Anna Egan, widow.	do	1880	15 30		
67934	207	Kansas City, Lawrence and Southern Kansas Railroad Company.	do	1881	12 95		
73400	208	do	do	1881	16 34		
66273	210	Henry A. Sayre, deceased; Cornelia F. Sayre, administratrix.	do	1863	1,900 00		
63338	242	Atchison, Topeka and Santa Fé Railroad Company.	do	1880	595 35		
62222	260	Central Pacific Railroad Company	do	1881	14 20		
62083	261	do	do	1881	36 20		
64355	262	Chicago, Rock Island and Pacific Railroad Company.	do	1881	88 45	.....	See list 50 per cent.
64355	262	Central Pacific Railroad Company	do	1881	3 79		
67933	288	Kansas City, Lawrence and Southern Kansas Railroad Company.	do	1880	216 80		
66360	312	do	do	1881	203 37		
73435	313	Leighton and Jordan	do	1881	270 06		
67932	321	Kansas City, Lawrence and Southern Kansas Railroad Company.	do	1880	228 74		
66271	331	Amasa C. Hall, deceased; Edward Ray and John Brewster, trustees.	do	1863	$200 00		
65422	333	Stephens and Condit Transportation Company.	do	1862	800 00		
73490	338	Frank F. Eastman, lieutenant Fourteenth Infantry.	do	1881	10 50		
64725	399	Hannibal and Saint Joseph Railroad Company.	do	1879	2 68		
64745	400	do	do	1880	16 03		
65191	419	Buffalo Bayou, Brazos and Colorado Railroad Company.	do	1865	274 00		
54167	470	Hannibal and Saint Joseph Railroad Company.	do	1879	164 04		
65224	488	National Mail and Transportation Co	do	1880 and 1881	157 00		
73312	499	William J. Jarrell	do	1862	13 25		
65883	332	James P. Stetson, deceased; Susan L. Stetson, administratrix.	do	1863	202 50		
65883	332	John Russell	do	1863	202 50		
58684	512	Hannibal and Saint Joseph Railroad Company.	do	1881	7 00		

* Quartermaster's account.

Amounts allowed by the accounting officers of the Treasury Department—Continued.

ALLOWED BY THE THIRD AUDITOR AND THE SECOND COMPTROLLER, UNDER SECTION 4, ACT OF JUNE 14, 1878—Continued.

No. of certificate or claim.	No. of settlement.	Name of claimant.	Appropriation from which payable.	Fiscal year in which the expenditure was incurred.	Amount.	Total.	Remarks.
		WAR DEPARTMENT—Continued.					
		CLAIMS—continued.					
63547	513	Hannibal and Saint Joseph Railroad Company.	Army transportation, 1881 and prior years (section 1133, Revised Statutes).	1881	$2 10		
73598	567	Kansas City, Lawrence and Southern Kansas Railroad Company.	do	1880	21		
73764	569	Kansas City, Fort Scott and Gulf Railroad Company.	do	1880	46 85		
73645	588	George Peoples	do	1880	14 00		
65629	543	A. J. Buckner, deceased; William A. James, administrator.	do	1862	6,000 00		
66267	544	Swiftsure Transportation Company, R. Loper Baird and Preston K. Erdman, assignees.	do	1863	2,900 00		
73765	599	Kansas City, Fort Scott and Gulf Railroad Company.	do	1879	374 73		
53792	639	Charles A. Cart	do	1863	77 50		
66357	640	Owen V. Jarrett	do	1863	77 50		
66357	640	Columbus C. Jarrett	do	1863	62 50		
66357	640	James C. Jarrett	do	1863	85 00		
73850	657	Morgan's Louisiana and Texas Railroad Company.	do	1881	159 04		
65420	700	Randolph Barton, receiver of the Individual Enterprise Company, of Baltimore, Md.	do	1863	1,600 00		
60507	701	Alfred D. Foster, administrator of George Aldus, deceased.	Owners of steamer C. W. Thomas.	do	1863	275 00	
60507	701	Nathaniel McKay		do	1863	275 00	
60507	701	Samuel Bell		do	1863	275 00	
60507	701	Anna B. Hunt, administratrix of James W. Hunt, deceased.		do	1863	275 00	
61001	653	Milo Gist, deceased; S. T. Hays, administrator.		do	1864	30 00	
66354	711	John Burton, deceased; George W. Burton, administrator.		do	1862	112 72	

66354	711	Robert Burton, deceased; George W. Burton, administrator.	Shareholders in Philadelphia Steam Pump and Towing Company.	do	1862	225 00		
66354	711	John R. Penrose, deceased; Edward Burton and Walter E. Penrose, administrators.		do	1862	112 73		
66354	711	C. J. Ingersoll, deceased: C. Ingersoll, Harry Ingersoll, and E. Ingersoll, executors.		do	1862	71 10		
66354	711	Henry Virden		do	1862	228 60		
73918	752	Northern Pacific Railroad Company		do	1881	29 96		
66353	805	Schooner Allen Middleton, jr., and owners		do	1862	265 82		
53745	827	Nathan Dennis		do	1864	22 00		
66073	828	Lindsey, James, deceased; Matilda James, widow.		do	1864	8 00		
73921	838	James R. Byron		do	1864	75 00	.....	See list "Regular supplies, Quartermaster's Department."
40639	839	R. J. McSparren		do	1864	129 00		
65526	843	Philadelphia, Wilmington and Baltimore Railroad Company.		do	1861	779 13		
74094	844	Denver and Rio Grande Railway Company		do	1881	1,958 92		
74075	846	Missouri Pacific Railway Company		do	1881	1,082 65		
61173	871	James W. Flint, deceased; Lydia F. Flint, mother.		do	1865	91 50		
47775	902	Patrick Jennings		do	1864	94 95		
73941	904	Anderson Davis		do	1862 and 1863	290 50		
(*)	9792	Charles G. Sawtelle, major and quartermaster, United States Army.		do	1877	62	.....	Quartermaster's settlement.
65419	939	Robert A. Morgan		do	1863	870 50		
65735	944	Nathaniel McKay	Owners of steamer Argo.	do	1864	1,013 75		
65735	944	George Aldus, deceased; Alfred D. Foster, administrator.		do	1864	1,013 75		
64357	945	Dallas Garner		do	1865	24 00		
(*)	9856	Charles H Campbell, captain and assistant quartermaster.		do	1877 and prior years.	252 00	.....	See lists "Regular supplies," "Incidental expenses," and "Barracks and quarters."
66962	1086	George M. Morrison		do	1862	833 30	.....	See list "Horses lost," and other property, act of March 3, 1849.
73629	1109	Atchison, Topeka and Santa Fé Railroad Company		do	1881	100 00		
74307	1110	New Orleans, Saint Louis and Chicago Railroad Company, now known as the Chicago, Saint Louis and New Orleans Railroad Company.		do	1876	4 91		
74367	1111	Morgan's Louisiana and Texas Railroad Company and Steamship Company.		do	1881	334 05		

*Quartermaster's account.

Amounts allowed by the accounting officers of the Treasury Department—Continued.

ALLOWED BY THE THIRD AUDITOR AND THE SECOND COMPTROLLER, UNDER SECTION 4, ACT OF JUNE 14, 1878—Continued.

No. of certificate or claim.	No. of settlement.	Name of claimant.	Appropriation from which payable.	Fiscal year in which the expenditure was incurred.	Amount.	Total.	Remarks.
		WAR DEPARTMENT—Continued.					
		CLAIMS—continued.					
65908	1151	Thomas Bulger, whose true name was Richard Cummings, deceased; Martha Cummings, widow.	Army transportation, 1881 and prior years. (Section 1133 Revised Statutes).	1880	$34 00		
65565	1206	William H. Foster, receiver of Union Steamship Company.	....do	1863	3,900 00		
65719	1210	M. C. Mathews, deceased; by Mary Mathews, widow.	....do	1865	40 00		
66079	1207	Missouri Pacific Railway Company	....do	1876	1,056 39		
60106	514	Hannibal and Saint Joseph Railroad Company.	....do	1881	9 70	.....	See list for 50 per centum of arears.
64726	673	Caleb Brown	....do	1866	53 00		
65560	1308	Baltimore and Ohio Railroad Company	....do	1861	32,788 48		
73516	1331	Thomas Johnson	....do	1881	28 00		
60588	1332	F. M. Rains	....do	1881	7 89		
74585	1330	Richard Devers	....do	1881	15 00		
74109	1435	Saint Paul, Minneapolis and Manitoba Railway Company.	....do	1878	13 20	.....	Do.
65544	1425	Tunks and Brown	....do	1865	54 40		
73965	1496	Catherine Ransom, administratrix of Giles T. Ransom, deceased.	....do	1863	105 33		
73683	1498	Robert Raulston	....do	1864	90 93		
74686	1497	Denver and Rio Grande Railway Company	....do	1881	902 75		
74483	1535	Eliza Taylor, mother of James Carroll Taylor.	....do	1862	17 43		
66268	1536	Thomas Clyde	....do	1863	450 00		
66627	1538	The Commercial Transportation Company	....do	1863	2,730 00		
74748	1548	Saint Louis and Saint Paul Packet Company	....do	1881	39 96		
73770	1545	Frank Hopkins	....do	1865 and 1866	140 00		
74628	1615	Denver and Rio Grande Railway Company	....do	1881	6,281 38		
74349	1649	David Miklejohn	....do	1862	18 00		
57155	1715	Steamer Monitor and owners	....do	1863 and 1864	5,975 00		
(*)	369	Samuel B. M. Young, captain Eighth Cavalry.	....do	1877 and prior years.	80 97		
(*)	398	Daniel H. Brush, lieutenant Seventeenth Infantry.	....do	1881	25		
73734	1864	Moses A. Share	....do	1865	60 00		

2960	1879	Addison Peters	do	1862	300 00		
75155	1893	Inland and Seaboard Coasting Company	do	1880	25		
74152	1919	Saint Paul, Minneapolis and Manitoba Railway Company.	do	1879 to 1881	150 93		See 50 per centum list.
74180	1965	do	do	1879 to 1881	85 35		
75224	1973	Inland and Seaboard Coasting Company	do	1878 to 1880	24 13		Do.
75237	1978	Denver and Rio Grande Railway Company's express.	do	1881	7 00		
75292	1997	do	do	1881	1 65		
75289 / 75301	1998	Denver and Rio Grande Railway Company.	do	1881	107 14		
75281	1999	do	do	1878	23 58		
75293	2001	Denver and Rio Grande Railway Company's express.	do	1880	1 87		
75290	2002	Denver and Rio Grande Railway Company.	do	1879	234 22		
75286	2003	do	do	1877	112 09		
75280	2011	do	do	1876	76 00		
75291	2012	Denver and Rio Grande Railway Company's express.	do	1881	157 93		
64844	2014	William Treas	do	1862	25 00		
75206	2051	E. C. Crewshan	do	1864	26 95		
(*)	647	Charles P. Stivers, lieutenant Ninth Infantry.	do	1881	2 25		
11572	2140	W. A. Rankin	do	1865	52 73		
75510	2214	Atchison, Topeka and Santa Fé Railroad Company.	do	1881	11 18		
75436	2215	Inland and Seaboard Coasting Company	do	1881	6 84		
75313	2321	Kansas City, Lawrence and Southern Kansas Railroad Company.	do	1881	4 58		
75303 / 75304	2286	Denver and Rio Grande Railway Company.	do	1881	93 26		
75604	2309	Missouri Pacific Railway Company	do	1881	1 11		
75568	2343	James C. White	do	1863	75 00		
61300	2397	C. A. Broadwater	do	1881	306 04		
74864	2451	Atchison, Topeka and Santa Fé Railroad Company.	do	1877 to 1880	1,957 51		
65630	2463	Baltimore Steam Packet Company	do	1863 and 1864	1,900 00		
65631	2464	do	do	1863 and 1864	10,216 67		
						$148,536 37	
		BARRACKS AND QUARTERS.					
42484	7168	William D. Battle	Barracks and quarters, 1881 and prior years (section 1133, Revised Statutes).	1876	1 50		
(*)	8110	H. L. Thayer, late captain, assistant quartermaster.	do	1877 and prior years.	191 52		See list "Regular supplies, Quartermaster's Department;" balance on quartermaster's account.
24866	7573	C. T. Woolfork, deceased; P. H. Wallace, executor.	do	1866	270 00		

* Quartermaster's account.

Amounts allowed by the accounting officers of the Treasury Department—Continued.

ALLOWED BY THE THIRD AUDITOR AND THE SECOND COMPTROLLER, UNDER SECTION 4, ACT OF JUNE 14, 1878—Continued.

No. of certificate or claim.	No. of settlement.	Name of claimant.	Appropriation from which payable.	Fiscal year in which the expenditure was incurred.	Amount.	Total.	Remarks.
		WAR DEPARTMENT—Continued.					
		CLAIMS—continued.					
39738	12	J. S. Stephens, deceased; Sallie J. Stephens, widow.	Barracks and quarters, 1881 and prior years (section 1133, Revised Statutes).	1868	$13 00		
39053	13	William Muir	do	1866	250 00		
73412	221	A. C. Taylor, lieutenant Second United States Artillery.	do	1881	37 60		
55976	337	George T. Cottrell, deceased; Mary M. Cottrell, widow of.	do	1873	5 60		See lists "Regular Supplies," and "Subsistence of the Army."
27100	908	Leonard Edelen, deceased; L. G. Edelen and L. A. Spalding, administrators.	do	1862	200 00		
73613	956	O. W. Mathers	do	1864	5 00		
(*)	9856	Charles H. Campbell, captain and assistant quartermaster.	do	1877 and prior years.	75 00		See lists "Army transportation," "Regular supplies," and "Incidental expenses."
33237	1014	T. C. Reed, deceased; Elizabeth Estes, late widow, and guardian of the children.	do	1863	40 00		
39831	1015	A. J. Cooper	do	1864	10 00		
26490	1017	John Deane, deceased, heirs of	do	1863	50 00		
73372	1152	N. C. Sawyer	do	1867	40 00		See list "Regular supplies."
66476	1212	Louis A. Von Hoffman and William Mertens (composing firm of L. Von Hoffman & Co.), and Wm. H. Newman.	do	1862-'3-'4-'5-'6	18,430 56		
74174	1323	Thomas J. Shuck	do	1880	41 25		
56527	1511	James Kearns	do	1869	50 00		
74892	2096	City of Paducah, Ky	do	1865 and 1866	80 00		
7044	2394	Saint Peter's Catholic Mission	do	1850 to 1855	300 00		
						$20,091 03	
		CAVALRY AND ARTILLERY HORSES.					
29777	7077	H. N. Todd	Horses for cavalry and artillery, 1881 and prior years (section 1133, Revised Statutes).	1865	130 00		
24790	7120	Thomas Sullivan	do	1863	125 00		
64242	7121	George W. Kirk	do	1865	96 00		
31251	7125	William Brown	do	1865	155 00		
64424	7247	James Greenway	do	1863	100 00		
10696	7248	Thomas N. Lawrence	do	1863	135 00		
10204	7249	Andrew W. Kain	do	1864	120 00		

64453	7250	Barnard Murray	do	1865	165 00		
34362	7251	Fountain E. P. Britton	do	1864	85 00		
64604	7364	John E. Klepper	do	1864	125 00		
59925	7386	Charles Polvogt, deceased; Emilie Bissinger, executrix.	do	1865	140 00		
58604	7387	Wesley Hyde	do	1865	58 00		
60658	7440	John L. Payne	do	1862	130 00	.....	See list "Regular supplies, Quartermaster's Department."
44753	7529	John A. Morse	do	1864	55 00		
64920	7572	Adam Schnert	do	1864	90 00		
64455	7705	Eli A. Stockdale	do	1865	110 00		
64987	7706	Francis M. Berry or Barry	do	1865	100 00		
64688	9283	Dudley M. Messick	do	1863	90 00		
61388	9559	William G. Woodruff	do	1864	150 00		
65532	9713	George W. Brooks, deceased; D. A. Perryman, administrator.	do	1865	140 00		
12483	9811	Charles R. Anderson	do	1865	130 00		
65803	9877	Isaac Mann	do	1865	145 00		
65764	9810	Thomas J. McClennen	do	1863	110 00		
65157	317	Joseph A. Dollins	do	1863	60 00		
57266	318	James P. Williams	do	1864	90 00		
57881	322	Elias Bass	do	1864	125 00		
39052	523	Henderson Lady	do	1865	300 00		
54082	525	William Butler	do	1864	130 00		
58998	529	Richard Alexander	do	1863	180 00		
58574	679	B. F. Anthony	do	1863	65 00		
64778	743	Joseph Potter	do	1865	140 00		
62282	748	Hamilton Dooly	do	1865	150 00		
57883	807	A. H. King	do	1863	75 00		
73909	820	Nicholas Dodd	do	1863	110 00		
23069	821	William Cox	do	1865	130 00		
61150	836	George B. Reed	do	1864	150 00		
74188	837	James C. Paullus	do	1865	155 00		
65339	1029	Abram Glenn	do	1864	30 00		
15411	1236	Silas N. Wilkinson	do	1864	125 00		
22375	1237	Henry C. Hollenbeck	do	1865	115 00		
31416	114	C. Freeman, Pat. O. Hawes, holder and owner.	do	1863	100 00		
74512	1602	Henry G. Simpson	do	1864	90 00		
74511	1603	Nancy Pruett, widow of Henry H. Pruett, deceased.	do	1863	90 00		
57385	1733	T. J. Morehead, administrator of James Fishback, deceased.	do	1865	125 00		
37828	2097	Asa Burrell, J. N. Bell, holder and owner.	do	1865	130 00*		
						5,349 00	
		CLOTHING, CAMP AND GARRISON EQUIPAGE.					
(*)	8935	Charles G. Penney, lieutenant Sixth United States Infantry, acting assistant quartermaster.	Clothing, camp and garrison equipage, 1881 and prior years (section 1133, Revised Statutes).	1877 and prior years.	05	.....	Balance on account (see "Army transportation" list.)

*Quartermaster's account.

Amounts allowed by the accounting officers of the Treasury Department—Continued.

ALLOWED BY THE THIRD AUDITOR AND THE SECOND COMPTROLLER, UNDER SECTION 4, ACT OF JUNE 14, 1878—Continued.

No. of certificate or claim.	No. of settlement.	Name of claimant.	Appropriation from which payable.	Fiscal year in which the expenditure was incurred.	Amount.	Total.	Remarks.
		WAR DEPARTMENT—Continued.					
		CLAIMS—continued.					
(*)	9660	Fielding L. Davies, lieutenant Twenty second United States Iufantry, acting assistant quartermaster.	Clothing, camp and garrison equipage, 1881, and prior years (section 1133, Revised Statutes.)	1877 and prior years.	$5 93	.....	Balance on account.
67808	135	C. C. Miner, lieutenant Ninth United States Infantry.	.....do.....	1881.....	10 00		
(*)	9884	John M. Ross, lieutenant Twenty-first Infantry, acting assistant quartermaster.	.....do.....	1877 and prior years.	01		
(*)	9939	Charles H. Campbell, captain Sixth United States Cavalry.	.....do.....	1878.....	28 10		
(*)	385	Charles A. Booth, lieutenant Seventh Infantry, U. S. A.	.....do.....	1879.....	15 12	$59 21	
		SUBSISTENCE OF THE ARMY.					
51175	7046	James Robinson, or Roberson.....	Subsistence of the Army, 1881 and prior years (section 1141, Revised Statutes).	1863 and 1864..	22 40		
62107	7117	Charles Hermann, or Herrmann	.....do	1864.....	9 75		
64196	7208	Edward Merrills.....	.....do	1865.....	5 00		
64328	7221	Allen G. Thurman	.....do	1865.....	7 50		
64377	7244	William H. Bentz.....	.....do	1865.....	5 50		
64380	7245	John H. Dickey.....	.....do	1865.....	7 50		
64383	7246	Abram Ingalls.....	.....do	1864.....	5 00		
61018	7253	John H. Kraft	.....do	1864.....	43 00		
64400	7273	Joseph D. Lewis	.....do	1864.....	7 50		
64501	7360	Rainey Sears.....	.....do	1863.....	15 00		
64548	7361	George L. Sellon.....	.....do	1865.....	7 50		
64646	7383	Wesley A. McDonald.....	.....do	1864.....	7 50		
64576	7400	Thomas Wines, or Wine	.....do	1865.....	3 75	.....	See list "Commutation of rations," "Prisoners of War."
64681	7428	Charles F. Reatherford.....	.....do	1864 and 1865..	15 00		
64739	7530	Joseph Householder	.....do	1864.....	7 50		
64771	7575	Francis North	.....do	1864.....	4 75		
64913	7735	Alexander Hart.....	.....do	1864.....	7 50		
64948	7783	Wilhelm Urban.....	.....do	1866.....	7 00		
65081	9284	John J. Parkey.....	.....do	1864.....	30 00		

64950	9285	James W. Barnes	do	1865	11 25		
64546	9340	John W. Gillin	do	1865	4 75		
65024	9341	Bradly Crippen	do	1864	7 50		
64980	9342	George E. Woodruff	do	1864	8 75		
64976	9343	John L. McGuire	do	1864	7 50		
65025	9344	Harvey J. Covell	do	1862 and 1863	10 00		
65022	9345	Oliver P. Boughner	do	1864	7 25		
64971	9354	Commodore Argubright	do	1865	7 50		
65029	9375	William Elliott	do	1862	7 50		
65083	9496	Alvah A. Eaton	do	1866	4 00		
65288	9551	George H. Hafertepen	do	1864	7 50		
65324	9578	James F. Andrus	do	1863	13 00		
653.3	9579	John Ambrose	do	1863	15 00		
65103	9584	Jay D. Morse	do	1865	26 75		
65194	9618	J. P. Austin	do	1863	2 50	.....	See list "Army transportation."
65373	9623	Lorenzo S. Bryant	do	1864	7 50		
61582	9640	Cyrus H. Crissey	do	1864 and 1865	49 25	.....	See list "Prisoners of war."
64685	9641	J. C. Young	do	1864 and 1865	41 50		
65412	9642	Matthew Patterson	do	1865	17 50		
65374	9674	James Crocker	do	1863	7 50		
65371	9687	Solomon R Beam	do	1864	5 00		
65389	9698	John H. Taylor	do	1865	5 00		
65377	9690	H. Joseph Pille	do	1864	7 50		
65450	9715	Martin C. Carmody	do	1864	7 50		
65455	9716	Joseph Jackson	do	1864	10 50		
65444	9717	Stephen A. Randall	do	1863	14 75		
65453	9718	Charles Humphrey	do	1863	7 50		
65452	9719	George A. Melvin	do	1864	7 50		
65451	9720	Henry George	do	1864	5 00		
65534	9744	Arthur M. Sumner	do	1865	7 50		
65549	9745	Harding Smith	do	1864	7 25		
65529	9746	Richard Dwight, deceased; Jane Dwight, widow.	do	1864	7 50		
65550	9747	William L. Ten Brook	do	1864	7 50		
65548	9748	Christopher Patrick	do	1864	7 50		
65531	9749	Ira P. Jones	do	1862	14 25		
65594	9750	Alonzo Allen	do	1863	5 00		
65527	9751	Alexander O'Campbell	do	1865	4 25		
65511	9752	Thomas M. Smith	do	1865	7 50		
65512	9753	William A. Upham	do	1864	7 50		
65503	9754	David H. Helms	do	1864	7 50		
65505	9755	John H. B Jenkins	do	1865	59 25		
65504	9756	Augustus E. Holcomb	do	1864	7 50		
65501	9757	Job Fithian	do	1864	7 50		
65547	9758	Alfred Flesher	do	1864	7 00		
65579	9794	Richard B. Cash	do	1863	40 00		
65633	9795	James M, Baird	do	1864	6 50		
65634	9796	John Baird	do	1864	7 50		
65597	9797	G. W. Resoner	do	1864	9 00		
65581	9798	John A. Fissell	do	1864	7 50		

* Quartermaster's account.

Amounts allowed by the accounting officers of the Treasury Department—Continued.

ALLOWED BY THE THIRD AUDITOR AND THE SECOND COMPTROLLER, UNDER SECTION 4, ACT OF JUNE 14, 1878—Continued.

No. of certificate or claim.	No. of settlement.	Name of claimant.	Appropriation from which payable.	Fiscal year in which the expenditure was incurred.	Amount.	Total.	Remarks.
		WAR DEPARTMENT—Continued.					
		CLAIMS—continued.					
65291	9819	Edgar Robinson	Subsistence of the Army, 1881 and prior years (section 1141, Revised Statutes).	1864 and 1865	$15 00		
65705	9926	Benjamin A. Clemons	do	1863	5 00		
65704	9927	Thomas Cole	do	1862	7 50		
65701	9928	Uriah Axley	do	1862	4 75		
65711	9929	R. J. Thomson	do	1863	7 50		
65816	9930	William Groenendyke	do	1863	5 00		
65750	9931	Barney H. White	do	1863	23 75		
65708	9932	Albert E. McClure	do	1864	7 50		
64951	9933	Aaron Kirkendall	do	1864	7 50		
65812	9934	Christopher C. Biggs	do	1864	7 50		
65781	9935	Thompson Creamer	do	1865	7 25		
65706	9936	Joseph H. Conner, deceased; Maria Conner, widow.	do	1865	7 50		
65817	9937	George W. Hale	do	1865	7 50		
65709	9938	Isaac Niles	do	1865	7 50		
65703	9939	Judson W. Barden	do	1866	5 00		
65702	9940	Alonzo Bradford	do	1864	7 50		
65814	9941	Charles E. Demmon	do	1665	3 75		
65670	9942	William A. Dewhitt	do	1864	7 50		
65788	9943	Elva Perry, deceased; Maria Richardson, late widow.	do	1862	15 75		
65673	9944	Merrill Morgan	do	1864	7 50		
65712	9945	John E. Turner	do	1865	5 00		
65901	9991	Chauncey W. Wheeler	do	1865	2 50		
65849	9992	Alexis R. Hubbard	do	1865	2 50		
65900	9996	Alonzo Laccoarce	do	1864	7 25		
65853	9997	Eugene Rollmann	do	1864	7 50		
65851	9998	George P. Reed	do	1865	5 00		
64649	3	Samuel Holmes	do	1862–1865	9 25		
65387	14	George H. Glick	do	1865	7 50		
66105	19	James K. Sturgeon	do	1864	15 00		
66266	20	Robert Wright	do	1865	4 75		
66080	21	William Brawner	do	1864	7 50		
66085	22	Festus C. Hayes	do	1864	7 50		

66081	23	William Boas	do	1863	15 00		
66259	24	Jonathan B. Bozorth	do	1864	7 50		
26608	110	L. J. Treece	do	1862	48 60		
65104	115	Joseph H. Steele	do	1865	91 50		
65508	229	Charles S. Ruble	do	1862	5 00		
66171	230	John A. Spaulding (Spalding)	do	1864	6 25		
66063	231	H. L. Housley	do	1865	7 50		
65951	232	Elisha Bailey	do	1864	7 50		
66151	233	Jacob North	do	1865	7 25		
64500	248	Henry W. Nickerson	do	1863	7 50		
65848	249	David Cantonwine	do	1865	7 50		
66153	268	Charles Pagett	do	1864	7 50		
66149	269	William F. Neely	do	1864	33 25		
65981	270	George W. Carl	do	1862	60 25		
65947	271	Wilhelm Asmus	do	1863	1 75		
66152	272	Thomas J. Nolan	do	1864	7 50		
66187	294	Daniel Snider	do	1863	7 75		
66145	295	Reuben H. Morgan	do	1865	7 50		
66009	296	William T. Duke	do	1864	11 25		
65970	335	Benjamin F. Bowlin, deceased; Priscilla Bowlin, widow.	do	1865	13 75		
64949	336	Mark Burkley ... C. C. Wells, holder	do	1863	22 12		
64949	336	James Maxwell... and owner	do	1863	39 65		
55976	337	George T. Cottrell, deceased; Mary M. Cottrell, widow.	do	1873	8 00	.....	See "Regular supplies" and "Subsistence of Army."
(*)	8189	Julius H. Pardee, lieutenant Thirteenth United States Infantry.	do		353 71	.....	Special settlement, subsistence of the Army.
65850	366	Andrew S. Owen	do	1865	3 75		
65032	367	Perry G. Marquis	do	1864	5 00		
66008	386	Henry C. Durstine	do	1865	6 25		
65989	387	Lewis Cox	do	1864	5 00		
65985	388	Nathaniel Cohee	do	1864	6 75		
65635	389	Eli B. Black	do	1864 and 1865	6 75		
65506	390	Franklin Mitchell	do	1865	6 00		
61470	447	Martin Barringer	do	1863	12 50		
64578	448	William H. Gaston	do	1865	6 25		
65968	471	Edwin Bole	do	1865	13 75		
66157	472	Thomas Pearson	do	1864 and 1865	15 00		
66025	473	Rodney Fuller	do	1865	7 50		
66035	474	Henry J. Goff	do	1864	7 50		
66044	475	George Haymaker	do	1864	6 50		
66021	476	James R. Frame	do	1864	7 50		
66015	477	Andrew J. Erwin	do	1866	4 75		
66116	478	Nathaniel W. Kline	do	1862	5 00		
66113	479	Hiram V. Keys	do	1865	15 00		
66125	480	Enos Ludden	do	1864	7 50		
66121	481	Hart Landon	do	1864 and 1865	7 50		
66036	486	Wilbur E. Gorsuch	do	1864	7 50		
65986	493	Henry Cover	do	1864	5 00		
66007	511	Benjamin B. Duke	do	1865	17 50		

* Subsistence account.

Amounts allowed by the accounting officers of the Treasury Department—Continued.

ALLOWED BY THE THIRD AUDITOR AND THE SECOND COMPTROLLER, UNDER SECTION 4, ACT OF JUNE 14, 1878—Continued.

No. of certificate or claim.	No. of settlement.	Name of claimant.	Appropriation from which payable.	Fiscal year in which the expenditure was incurred.	Amount.	Total.	Remarks.
		WAR DEPARTMENT—Continued.					
		CLAIMS—continued.					
66167	541	Simeon Roth	Subsistence of the Army, 1881 and prior years (section 1141, Revised Statutes).	1864 and 1865	$119 50		
66217	565	Patrick H. Wilson	do	1864	7 50		
66010	591	Eli Dyer	do	1865	13 25		
66119	593	Charles E. Lafferty	do	1865	5 00		
61642	597	A. L. Hawkins, deceased; J. S. Parish, administrator.	do	1865	49 20		
(*)	9484	James H. Baldwin, lieutenant Eighteenth Infantry, United States Army.	do	1879	6 68		
65944	632	James Atkinson	do	1864	7 50		
66004	633	Charles H. Dagle	do	1864	4 75		
66166	634	Francis W. Rowley	do	1865	10 25		
68128	634½	Isaac B. Hardy	do	1864	7 50		
66168	637	John T. Roark	do	1865	3 50		
65966	644	James P. Bills	do	1866	5 75		
47276	648	Elijah V. Harding	do	1866	18 75		
66041	663	Robert W. Hamilton	do	1865	14 25		
66193	664	William H. Talbert	do	1865	15 00		
66155	665	James Parker	do	1865	7 50		
66197	677	John H. Thomas	do	1864	10 00		
65990	678	Julius Cook	do	1864	7 50		
64945	693	William H. Groom	do	1865	7 50		
66070	694	Albert F. Huggins	do	1865	7 50		
66208	695	Eddy P. Wade	do	1864	11 50		
66115	696	Henry Kennedy	do	1864	7 50		
66182	697	James W. Thompson	do	1862	15 00		
65789	702	George H. Slaybaugh	do	1862	36 75		
66112	710	William Larter	do	1862	14 50		
68669	724	Edmon Ogden	do	1865	3 75		
66134	725	Thomas McKeniry	do	1864	7 50		
38918	810	Mathias Waggener	do	1864	21 00		
66045	850	Matthias K. Hale	do	1865	5 00		
65943	901	James B. Ayres	do	1864 and 1865	15 00		
66114	924	Terrence Keeley, deceased; Bridget Keeley, widow.	do	1865	7 50		

66126	925	Ephraim E. Lake	do	1862	26 00	
66163	926	William F. Reed	do	1865	5 00	
66047	927	Harry W. Harvey, deceased; Amanda E. Fitzwater, late widow.	do	1864	3 75	
65997	928	Charles Davis	do	1864	7 50	
65996	929	Wilbur F. Crummer	do	1864	7 50	
65977	930	Amasa Clark, jr	do	1865	3 75	
65942	931	Christian R. Albery	do	1864	19 25	
66064	932	John H. Hoyt	do	1865	7 50	
66042	933	George Hamilton	do	1865	7 50	
66014	934	Joseph A. Elder	do	1865	5 00	
66022	935	James H. Farmer	do	1865	7 50	
66002	936	Wesley K. Dillon	do	1865	7 50	
66147	937	Amos Myers	do	1862	7 50	
66034	938	Phebe A. Gibbens, widow of Enoch Gibbens, deceased.	do	1865	5 75	
66173	957	Alfred D. Sargent	do	1862	7 50	
66184	958	Cyrus Sinnard	do	1864	14 25	
66165	959	William Riggs	do	1863	15 00	
65971	1019	John T. Borland	do	1862 and 1863	12 50	
65961	1020	Flavel Beadle	do	1865	7 50	
66144	1021	Odeal Moushang	do	1864	7 50	
66142	1022	William Morefield	do	1863	7 50	
66205	1023	Henry Wakeley	do	1864 and 1865	128 25	
73980	1024	William H. Jerrells	do	1863	12 50	
66012	1025	Jacob H. Edwards	do	1865	7 50	
66177	1026	Henry P. Stedman	do	1865	15 00	
73614	1028	R. F. Brooks	do	1864	11 00	
66169	1040	John S. Strain	do	1862	8 00	
65962	1078	Jacob R. Beers	do	1865	6 75	
66024	1311	Charles Dowe, *alias* Charles Fehland	do	1865	27 75	
66160	1333	John Purcell (or Pursell)	do	1862	15 00	
57782	1426	Henry House	do	1863	23 00	
66190	1440	Samuel Shumard	do	1865	5 75	..... See list "Commutation of rations."
66199	1464	George W. Utter	do	1865	7 50	
56527	1511	James Kearns	do	1869	68 68	..... See list "Regular supplies," "Incidental expenses," and "Barracks and quarters."
74383	1529	Henry T. Denins	do	1865	7 50	
74270	1530	David S. Hoyt	do	1864	5 00	
74271	1531	William Lamma	do	1865	7 25	
62584	1532	J. W. Harrison	do	1862	3 00	..... See list "Regular supplies."
74529	1610	David A. Broadstone	do	1865	7 50	
74490	1612	Thomas R. Degood	do	1864	7 75	
65973	1585	Henry Bush	do	1865	7 50	
74418	1586	John W. Hancock	do	1864	5 00	
74421	1587	William Unruh	do	1863	5 50	
74416	1588	Charles A. Constantine	do	1865	13 00	
74417	1589	William M. Dodd	do	1864 and 1865	15 00	
74388	1590	Elisha L. Oviatt	do	1864	21 25	

* Subsistence account.

Amounts allowed by the accounting officers of the Treasury Department—Continued.

ALLOWED BY THE THIRD AUDITOR AND THE SECOND COMPTROLLER, UNDER SECTION 4, ACT OF JUNE 14, 1878—Continued.

No. of certificate or claim.	No. of settlement.	Name of claimant.	Appropriation from which payable.	Fiscal year in which the expenditure was incurred.	Amount.	Total.	Remarks.
		WAR DEPARTMENT—Continued.					
		CLAIMS—continued.					
74389	1591	Benjamin B. Wheaton	Subsistence of the Army, 1881 and prior years (section 1141, Revised Statutes).	1864	$7 50		
74386	1592	John C. Kitchin	do	1864	7 50		
58483	1731	George Perdue	do	1863	28 96		
74842	1761	Angus McFadden	do	1865	7 50		
74839	1763	John Coughlan	do	1864	3 75		
66192	1774	Daniel J. Tennison	do	1863	5 00		
66215	1775	Henry Weidensaul	do	1863 to 1865	17 25		
74911	1818	Jacob M. Barron	do	1865	5 00		
74929	1826	William F. Larrabee	do	1862	14 00		
65963	1838	James Bennett	do	1864	13 75		
66132	1839	William H. McPherson	do	1862	4 75		
66117	1872	Lafayette King	do	1865	54 00		
75000	1926	Walker A Fields	do	1864	7 50		
74999	1927	George R. Carson	do	1862	5 50		
75003	1953	John C. Bloomfield	do	1864 and 1865	92 00		
75005	1957	Frederick D. Owen	do	1864	7 50		
75026	1958	Presby H. Cobble	do	1865	3 75		
75025	1959	Joseph F. Carr	do	1864	11 75		
75090	1989	Joel F. Deboard	do	1864	7 50		
66146	2030	R. A. Moss	do	1863	3 75		
75092	2032	John D. Sheerer	do	1865	7 50		
75121	2067	Joseph L. Bailey	do	1865	8 25		
74750	2068	William F. Bishop	do	1864	7 50		
73944	2069	Frederick Huber	do	1864	2 00		
75124	2070	Isaac N. Hickle	do	1862	5 25		
75125	2071	Ormond Hupp	do	1864	5 00		
75123	2072	George F. Guier	do	1865	5 00		
65857	2098	Lewis Wilkerson	do	1862	10 50		
66131	2138	Benjamin F. McCrady	do	1865	7 50		
75129	2143	Samuel B. Weidner	do	1864	7 50		
75230	2228	Edson A. Wood	do	1862 and 1863	14 75		
65987	2229	George M. Correll	do	1865	50 25		
65994	2256	Luke Crutchfield	do	1865	25 80		
75351	2257	Laura A. Jenkins, widow of C. W. Jenkins, deceased.	do	1865	7 50		

75349	2259	Oscar L. Cook	do	1865	7 50		
75372	2260	William W. Leighton	do	1866	5 75		
75350	2261	Christopher C. Gilbert	do	1863	23 50		
75369	2262	John L. Cochran	do	1865	7 50		
75196	2258	Henry A. Winter	do	1865	7 50		
75091	2336	Robert H. Sherman	do	1864 and 1865	84 00		
72082	2352	Ralph Case	do	1865	3 50		
75195	2388	Joseph M. Stokes	do	1864	5 00		
						$3,732 55	
		PAY, TRANSPORTATION, SERVICES, AND SUPPLIES OF OREGON AND WASHINGTON VOLUNTEERS IN 1855–'56.					
4837	9166	Samuel Wilson	Pay, transportation, services, and supplies of Oregon and Washington volunteers in 1855, 1856, 1871, and prior years (act of March 2, 1861).	1855 and 1856	69 44		
4838	9740	William Conover, deceased; Hollis D. and Otheo M. Conover, children.	do	1855 and 1856	31 91		
4838	9740	David M. Groom	do	1855 and 1856	73 89		
4839	1	Marshall Eccleston	do	1855 and 1856	33 58		
4840	334	Aaron (or Aron) Greenbaum	do	1855 and 1856	95 20		
4841	365	Silas R. Smith; Peter M. Coffin, assignee.	do	1865 and 1856	120 70		
4842	649	Edward Young & Co.; D. S. Baker, assignee.	do	1855 and 1856	250 00		
4844	650	John Boyer (or John P. Bowyer)	do	1855 and 1856	94 00		
4845	651	Elisha Padgett	do	1855 and 1856	61 00		
4843	652	William E. Klady, deceased; Samuel Klady, administrator.	do	1855 and 1856	227 32		
4846	1018	Ransom Freeman	do	1855 and 1856	75 71		
4847	1258	Isaac Warwick, deceased; by Joel C. Foster, administrator.	do	1855 and 1856	528 45		
4848	2082	William Allen	do		59 60		In surplus fund.
4849	2234	James M. Findley	do		25 00		Do.
						1,745 80	
		ROGUE RIVER INDIAN WAR, ACT JULY 17, 1854, AS EXTENDED BY ACT FEB. 2, 1871.					
21762	239	Newton Ball	Rogue River Indian War, prior to July 1, 1881.	1854	328 05		
21762	1439	Thomas V. Henderson, deceased; William Anderson, sr., administrator.	do	1854	256 57		
21762	2306	John Irvine	do		23 80		
21762	2306	Daniel W. Butler	do		29 73		
21762	2306	Henry Humphrey	do		237 14		
21762	2306	John D. Woodward	do		23 80		
						899 09	

Amounts allowed by the accounting officers of the Treasury Department—Continued.

ALLOWED BY THE THIRD AUDITOR AND THE SECOND COMPTROLLER, UNDER SECTION 4, ACT OF JUNE 14, 1878—Continued.

No. of certificate or claim.	No. of settlement.	Name of claimant.	Appropriation from which payable.	Fiscal year in which the expenditure was incurred.	Amount.	Total.	Remarks.
		WAR DEPARTMENT—Continued.					
		CLAIMS—continued.					
63615	949	James O'Hara	Twenty per cent. additional compensation prior to July 1, 1881 (under joint resolution of February 28, 1867.—14 Stat., 569).	1867	$84 00		
36394	1181	James (or Jamy) Courtney	do	1867	31 60	$115 60	
		Total				181, 357 64	

RECAPITULATION OF WAR DEPARTMENT CLAIMS ALLOWED BY THE THIRD AUDITOR AND SECOND COMPTROLLER.

Regular supplies, Quartermaster's Department, 1881 and prior years	$520 02
Incidental expenses, Quartermaster's Department, 1881 and prior years	308 97
Transportation of the Army and its supplies, 1881 and prior years	148, 536 37
Barracks and quarters, 1881 and prior years	20, 091 03
Horses for cavalry and artillery, 1881 and prior years	5, 349 00
Clothing, camp, and garrison equipage, 1881 and prior years	59 21
Subsistence of the Army, 1881 and prior years	3, 732 55
Pay, transportation, services, and supplies of Oregon and Washington volunteers in 1855–'56, 1871 and prior years	1, 745 80
Rogue River Indian war, prior to July 1, 1881	899 09
Twenty per cent. additional compensation, prior to July 1, 1881	115 60
Total	181, 357 64

ALLOWED BY THE FOURTH AUDITOR AND THE SECOND COMPTROLLER UNDER SECTION 4, ACT OF JUNE 14, 1878.

No. of certificate or claim.	Name of claimant.	Appropriation from which payable.	Fiscal year in which the expenditure was incurred.	Amount.	Total.	Remarks.
	NAVY DEPARTMENT.					
	CLAIMS.					
222	George H. Bright	Pay of the Navy, prior to July 1, 1881	1863 to 1867	$977 61		
12	Ike, *alias* Isaac Sims	do	1864	5 63		
5612	William J. Cunins, administrator of the estate of Daniel C. Cash, deceased.	do	1864	170 20		
5602	Mary Lee and Charlotte Smith, sisters and heirs of Wilson Woods, deceased.	do	1864	12 58		
5653	Anna Florence Currier, daughter of Jarvis G. Farrar, deceased.	do	1864	33 81		
5649	Benjamin Nelson, brother of Perry Nelson, deceased.	do	1865	11 36		
5649	Emily Nelson, sister of Perry Nelson, deceased.	do	1865	11 36		
5649	Betsey Nelson, sister of Perry Nelson, deceased.	do	1865	11 37		
318	Jacob Wilson	do	1865	13 66		
151	Nathan E. Williams	do	1865	73 41		
228	David S. Bostwick	do	1866	110 04		
5702	Hannah Robins, administratrix of the estate of Nathan Robins, deceased.	do	1866	18 25		
5587	Thomas H. Peto, administrator of the estate of James Manning, deceased.	do	1866	174 85		
158	Michael Woods	do	1868	42 25		
5646	Caroline Heineman, mother and administratrix of the estate of Theodore Heineman, *alias* Charles Baldwin, deceased.	do	1868	458 94		
69	George Anderson	do	1869	43 54		
169	Thomas McGlone	do	1871 to 1873	93 42		
161	John C. Chavalier	do	1871 to 1874	427 23		
80	W. A. Ferrier	do	1873 and 1874	198 07		
149	George Cowie	do	1873 to 1876	532 59		
254	Washburn Maynard	do	1874	96 40		
82	J. P. S. Lawrence	do	1876	2 46		
120	Frederick W. Dow	do	1877	61 82		
96	Charles P. Perkins	do	1877	76 54		
164	Thomas P. Smith	do	1877	60 42		
181	Edward Sinclair	do	1877	85 50		

Amounts allowed by the accounting officers of the Treasury Department—Continued.

ALLOWED BY THE FOURTH AUDITOR AND THE SECOND COMPTROLLER, UNDER SECTION 4, ACT OF JUNE 14, 1878—Continued.

No. of certificate or claim.	Name of claimant.	Appropriation from which payable.	Fiscal year in which the expenditure was incurred.	Amount.	Total.	Remarks.
	NAVY DEPARTMENT—Continued.					
	CLAIMS—continued.					
138	L. W. Wooster	Pay of the Navy, prior to July 1, 1881	1877	$180 38		
206	Andrew Milne	do	1878	42 11		
12	Frank M. Varrell	do	1878	225 52		
246	John H. Stevenson	do	1878	202 88		
215	John W. Coles	do	1878	150 55		
194	John B. Carpenter	do	1878	235 55		
227	Frank C. Cosby	do	1878	43 84		
229	Frederick W. Coffin	do	1878	73 00		
182	Robert Whiting	do	1878	64 11		
163	E. J. Whittaker	do	1878	73 00		
170	H. H. Hosley	do	1878	36 48		
187	Francis J. Higginson	do	1878	285 27		
69	Albert J. Kenyon	do	1878 and 1879	14 48		
10	F. B. Vinton	do	1878 and 1879	73 00		
105	E. D. Robie	do	1878 and 1879	68 32		
53	C. F. Norton	do	1878 and 1879	320 88		
5636	Francis B. Arnold, executor of the estate of Edward S. Keyser, deceased.	do	1878	59 83		
5621	Frank Moran, administrator of the estate of Martin Moran, deceased.	do	1868	158 44		
6071	Edward Donaldson	do	1854 to 1860	1,181 88		Allowed under the decision of the Supreme Court in the case of J. D. Graham.
6023	F. A. Roe	do	1856	281 05		Do.
6043	Joseph McDonald	do	1867	90 79		Do.
5989	S. B. Luce	do	1869	337 67		Do.
6046	William A. Mintzer	do	1869	266 57		Do.
6037	Edward Simpson	do	1869	311 90		Do.
6070	George W. Tyler	do	1869	660 73		Do.
6093	J. A. B. Smith	do	1869	373 90		Do.
6042	George R. Watkins	do	1867–'69	702 40		Do.
5988	George A. Lyon	do	1870	244 48		Do.
5999	Edward W. Sturdy	do	1871	215 84		Do.
6060	W. W. Queen	do	1847–'57, 1860, 1868.	1,858 07		Do.
6048	Mary P. King, widow of W. H. King	do	1868 and 1871	1,047 30		Do.
6066	A. H. Price	do	1869–'72	475 79		Do.

6053	C. J. McConnell	do	1869–'72	525 12		Do.
6072	J. F. Merry	do	1869–'72	1,101 63		Do.
6091	T. T. Caswell	do	1872	105 37		Do.
5997	B. P. Mimmack	do	1872	380 00		Do.
6063	A. G. Kellogg	do	1872	841 68		Do.
6064	J. R. Tryon	do	1872	437 80		Do.
6092	John G. Sankey	do	1872	105 37		Do.
5990	William W. Carter	do	1873	301 55		Do.
6033	James McDonnell	do	1873	140 40		Do.
6086	E. K. Boardman	do	1874	348 26		Do.
5987	J. C. P. de Krafft	do	1847–'56, –'74	1,2[illegible]0 21		Do.
6049	John L. Worden	do	1867–'69	477 60		Do.
6102	J. B. Aiken	do	1869	314 69		Do.
6054	James Nash	do	1873	268 23		Do.
6101	George E. Anderson	do	1863	375 05		Do.
6107	F. S. Bassett	do	1871–'72	394 90		Do.
6108	Nicholas Mager	do	1859–'62, –'73	356 50		Do.
					$21,833 68	
101	A. W. Grant	Pay, miscellaneous, 1881 and prior years	1879	181 88		
211	F. J. Sprague	do	1880	266 80		
240	B. H. Buckingham	do	1880	240 38		
224	Charles J. Buchan	do	1880	300 00		
142	William E. Webber	do	1880	121 09		
179	D. P. Wight	do	1880	296 50		
213	Alexander Henderson	do	1880	257 32		
104	John Garvin	do	1880	123 13		
172	William F. Halsey	do	1880	73 28		
91	Charles T. Grosvenor	do	1880	89 76		
337	Gorham F. Bassett	do	1881	301 50		
5661	Courtenaye N. Clarkson, widow and administratrix of Samuel F. Clarkson, deceased.	do	1881	139 17		
					2,390 81	
73	Albert Kaiser	Pay of the Marine Corps, prior to July 1, 1881.	1876	60 00		
64	H. C. Fisher	do	1879	188 38		
159	R. W. Huntington	do	1879	88 00		
					336 38	
5838	David Babcock & Co	Construction and repair, Bureau of Construction and Repair, 1881 and prior years.	1876		512 17	
182	Joseph C. Smith	Contingent, Bureau of Equipment and Recruiting, 1881 and prior years.	1863	12 00		
101	Jordan Roberts	do	1865	12 00		
37	Henry Jackson	do	1868	92 31		
					116 31	
	Total				25,189 35	

RECAPITULATION OF NAVY DEPARTMENT CLAIMS ALLOWED BY THE FOURTH AUDITOR AND THE SECOND COMPTROLLER.

Pay of the Navy, prior to July 1, 1881	$21,833 68
Pay, miscellaneous, 1881 and prior years	2,390 81
Pay of Marine Corps, prior to July 1, 1881	336 38
Construction and repair, Bureau of Construction and Repair, 1881 and prior years	512 17
Contingent, Bureau of Equipment and Recruiting, 1881 and prior years	116 31
Total	25,189 35

SUMMARY OF CLAIMS.

Treasury Department:		
Miscellaneous		$1,276 92
War Department:		
Second Auditor's accounts, Army	$523 02	
Third Auditor's accounts, Army	181,357 64	
		181,880 66
Navy Department:		
Fourth Auditor's accounts, Navy		25,189 35
Interior Department:		
Civil	12 98	
Public lands service	809 76	
		822 74
Department of Justice:		
Judicial expenses		6,781 45
Total		215,951 12

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. DOC. No. 56.

HARBOR OF REFUGE AT SANDY BAY, MASSACHUSETTS.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

A letter from the Chief of Engineers, inclosing reports, maps, and papers relating to the construction of a harbor of refuge at Sandy Bay, Massachusetts.

JANUARY 5, 1885.—Refered to the Committee on Rivers and Harbors and ordered to be printed.

WAR DEPARTMENT,
Washington City, December 24, 1884.

The Secretary of War has the honor to transmit to the House of Representatives a letter from the Chief of Engineers, dated the 20th instant, submitting copies of reports, with accompanying papers and maps, from the Board of Engineers appointed to comply with the conditions of the appropriation for constructing a harbor of refuge at Sandy Bay, Massachusetts, made in the river and harbor act of July 5, 1884.

ROBERT T. LINCOLN,
Secretary of War.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., December 20, 1884.

SIR: I have the honor to submit herewith copies of reports to this office, with accompanying papers and maps, from the Board of Engineers appointed to comply with the conditions of the appropriation for constructing a harbor of refuge at Sandy Bay, Massachusetts, made in the river and harbor act of July 5, 1884.

The river and harbor act of August 2, 1882, made provision for a survey of "Sandy Bay, Rockport, Mass., with a view to the construction of a breakwater for a harbor of refuge." In compliance therewith a survey was made by Maj. C. W. Raymond, Corps of Engineers, and a report thereon October 7, 1882, with a plan and estimates for the work,

which was submitted to the War Department, transmitted to Congress January 24, 1884, and printed in Senate Ex. Doc. No. 74, of the last session.

The river and harbor act of July 5, 1884, appropriates $100,000 for—

> Constructing a national harbor of refuge of the first class at Sandy Bay, Cape Ann, Massachusetts, * * * *Provided*, That a board of three engineers, to be appointed by the Secretary of War, shall decide that this point is the best location on the coast between Boston and Portland for such a harbor that shall serve all the uses for which it may be needed.

To comply with this provision a Board of Engineers was constituted July 28, 1884, which, after inspecting such points as it seemed advisable to visit, and giving the project of Major Raymond, above mentioned, careful consideration, made a preliminary report August 22, 1884, a copy of which is herewith, and also recommended further study by Major Raymond, with the view of considering the practicability and cost of constructing a harbor at Sandy Bay of smaller dimensions than that he projected, and also the question of a smaller harbor at the southeast point of Cape Ann, as well as the improvement of the harbor of Gloucester for the purpose of refuge.

Having been reconvened for the consideration of these points with the additional information thus furnished, the Board made a second report November 20, 1884, a copy of which is also herewith, which contains, as required by the act, their decision in the case.

In view of the magnitude and importance of this undertaking and the conclusions reached by the Board, I beg leave to suggest the transmission of these papers to the House of Representatives.

Very respectfully, your obedient servant,

JOHN NEWTON,
Chief of Engineers,
Brig. and Bvt. Maj. Gen.

Hon. ROBERT T. LINCOLN,
Secretary of War.

LETTER TRANSMITTING PRELIMINARY REPORT OF BOARD OF ENGINEERS.

UNITED STATES ENGINEER OFFICE,
Boston, Mass., August 23, 1884.

GENERAL: I have the honor to transmit herewith a preliminary report (with attached papers) of the Board of Engineers convened under Special Orders 91, headquarters Corps of Engineers, July 26, 1884, for the consideration of the proper location of a national harbor of refuge of the first class between Boston and Portland.

The Board adjourns to-day to be reassembled at the call of the senior member whenever the district engineer shall have completed certain examinations, &c., which he has been requested to make.

Very respectfully your obedient servantt,

CHARLES E. BLUNT,
Colonel of Engineers,
Senior Member of Board.

Brig. Gen. JOHN NEWTON,
Chief of Engineers, U. S. A.

PRELIMINARY REPORT OF BOARD OF ENGINEERS.

BOSTON, MASS., *August* 22, 1884.

GENERAL: The Board of Engineers constituted by Special Orders No. 91, headquarters Corps of Engineers, United States Army, July 26, 1884, to consider the location, plan, and estimates for a national harbor of refuge of the first class at Sandy Bay, Cape Ann, Massachusetts, met in this city on the 19th day of August, and has the honor to submit the following preliminary report:

In the exercise of the discretion left to it by the instructions of the Chief of Engineers, the Board has inspected such points on the coast as it seemed advisable to visit. The Board has also sought and obtained valuable written and oral information from various quarters.

The Board finds itself in the outset of its discussions confronted by the question whether it was expected to assume that Congress had already decided that a "national harbor of refuge of the first class, such as shall serve all the uses for which it may be needed," is necessary somewhere on the coast "between Boston and Portland," and that it is left to this Board simply to say whether, in its opinion, Sandy Bay is "the best place" for such a harbor of refuge; or if it be proper for the Board to consider whether it be necessary or expedient under existing circumstances to construct such a harber of refuge at *any* point between Boston and Portland.

It may be well here to state what the Board understands by the expression "national harbor of refuge of the first class." It may be defined to be an artificial harbor, prepared at the expense of the General Government, capable of affording refuge and shelter to a large number of vessels, great and small, at the same time, this refuge and shelter referring to danger from storms, actual or impending, as well as from hostile ships in time of war.

Such a harbor of refuge should be easy of entrance at all states of the wind and tide, by night as well as by day; should have sufficient depth and area at all stages of the tide; should be free from the hurtful action of strong winds and currents and of ice; should have a good holding ground, and be readily defended from hostile ships.

Very great depth is not only not necessary, but is undesirable, as requiring vessels to have very long cables and to take more time in coming to anchor and departing, as well as more room for swinging at anchor. Room is needed in a harbor not only for vessels quietly at anchor, but for those entering in the confusion and tumult of a gale to find a place among others already within. The speed of such vessels cannot be checked in a moment. Great artificial harbors of refuge, such as here described, are very few in the world, and, it may be added, very expensive to construct. The importance of such a harbor is greatly enhanced if it be at or near a great commercial center.

These being in our view the essential features of any harbor that may be properly designated "a national harbor of refuge of the first-class," it may be said at once that considering the present defenseless condition of the natural harbors in which our coasts abound, and the exposure of our navy-yards and our great maritime centers of commerce to the assaults of an enemy's fleet, it is wholly useless to construct an artificial harbor anywhere if its defensibility against a foreign enemy is to be regarded as one of its requisites.

It is not to be supposed that a fleet would require a refuge from an enemy. A single ship might need such a place of retreat near Cape Ann, and this could be readily afforded by the existing harbor of Glou-

cester to the northwest of Boston, as it would on the south at Provincetown.

The Navy of the United States does not at this time require much space for its accommodation. If the number of ships be increased they will be steamers, and could readily be accommodated in the harbors of Boston, Portland, or Provincetown, should it be deemed best to withdraw them from the open sea.

Leaving, then, the question of defense out of consideration we shall discuss the proposed harbor only with regard to its value as a place of refuge during storms.

Harbors of refuge are more important for sailing vessels than for steamers, as the latter are more navigable under the varying conditions of winds and currents. And this consideration is becoming of more importance every year, as the commerce of the world is more and more carried on by steam. As the steamers are more independent in movement as well as usually more quick, it would appear that a number of smaller harbors of refuge nearer together, the total cost being the same, would be more useful than one great one, as the former would be more convenient to the slower sailing vessels that happened to be caught by bad weather in their vicinity.

It must not be supposed that all wrecks would be prevented, if harbors of refuge, great and small, were numerous. Nor is it probable that such harbors would be used by all vessels, either steamers or sailors, as some, perhaps many, would prefer to go to sea rather than enter them. Insufficient crews and equipage and bad management will cause many wrecks to occur, notwithstanding the existence of natural harbors and the construction of artificial ones.

An idea of the necessity of a harbor of refuge in any special locality may be obtained by examining the record of wrecks that have occurred in its vicinity and the consequent loss of property.

Having made these general observations, let the ideas they involve be applied to the particular case under consideration, viz, the construction at Sandy Bay of "a national harbor of refuge of the first class."

The project of Major Raymond, as contained in his report of November 28, 1883, published in Senate Ex. Doc. No. 74, Forty-eighth Congress, first session, has been examined by the Board with attention and great interest. He proposes to inclose an area of 1,664 acres inside the high-water line, while on the 24-feet contour the area would be 1,377 acres.

It is estimated that 70,000 vessels pass Cape Ann annually. This would be about 6,000 each month or 200 each day. These are almost all bound to or from Boston, about half each way, or about 100 each way each day. Vessels going from Boston would seldom need a harbor of refuge at Cape Ann, as prudence would require them to refrain from leaving a good and safe harbor to risk the dangers of Cape Ann in a storm. Heavy storms seldom continue more than three days. It would seem sufficient, therefore, to provide for 100 vessels approaching Boston on each of the three successive days, or 300 vessels. Allowing $1\frac{1}{2}$ acres of anchorage ground to each, we would need a harbor of but 450 acres. One and one-half acres for each is an ample allowance.

Few of these vessels would have a draught exceeding 15 feet. To provide, therefore, an area of 500 acres with a depth at low water nowhere less than 30 feet would be enough. The plan of Major Raymond is estimated by him to cost $4,000,000 and to require ten years for its completion with regular annual appropriations of $400,000. It is thought by the Board that the cost should be set at not less than

$5,000,000, and to this should be added $500,000 for light-houses, buoys, &c., and not less than $2,000,000 for defenses, if they are to be considered.

It is not probable, judging of the future from the past, that $400,000 are to be appropriated each year for this object. The increase in the time of construction would greatly add to the final cost of the work.

An examination of a list of wrecks between the ports of Boston and Portland during the past fifty-five years, which has been furnished to the Board and is supposed to be authentic, gives the following information: The total number of wrecks in all these years has been less than 400. The vessels wrecked were almost all of small-size schooners. The least number reported in one year, 1831, was 1, and the greatest number was 40, in 1840. The average has been 7 or 8 per annum, and of these some at least would not have been prevented by a harbor of refuge at Sandy Bay. It may not be inappropriate also to compare the average annual loss with the interest on the total cost of such a harbor of refuge as is contemplated.

In view of all the circumstances of the case, the Board has reached the following conclusions:

It is not considered necessary or expedient at this time to construct "a national harbor of refuge of the first class" at any point "between Boston and Portland." Should Congress decide otherwise, the Board is of the opinion that Sandy Bay "is the best place" for such a harbor beween Boston and Portland. If Sandy Bay be occupied and the area of the harbor be made as great as proposed by Major Raymond the lines selected by him for the breakwater seem the best.

It is recommended that further study be given by Major Raymond to the consideration of the practicability and cost of construction of a harbor of smaller area at Sandy Bay, with a view mainly to a reduction of expense, and that in connection therewith he examine the question of constructing a smaller harbor at the southeast point of Cape Ann as well as the improvement of the harbor of Gloucester, which would be effected by a breakwater on the bar at its mouth.

Should it be decided by the authorities in Washington that a national harbor of refuge of the first class is to be made at Sandy Bay, it is considered that it would be inexpedient, with so small a sum as $100,000, to make any expenditure looking thereto except to commence the observations and studies which should precede the preparation of a detailed project for so great, difficult, and costly a work, and that actual construction should not be commenced until the engineer had in hand at least $500,000.

Additional information is needed as to the number and circumstances of the wrecks which have occurred in the past few years at or near Cape Ann, the number and classes of vessels passing that point, the annual loss of life and property, &c., and this information Major Raymond has undertaken to collect and tabulate.

The papers which accompany this report are the following copies:

1. Special Orders No. 91,* headquarters Corps of Engineers, U. S. Army, Washington, D. C., July 26, 1884.
2. Letter of July 8, 1884, from Hon. E. F. Stone, M. C., to the honorable Secretary of War.
3. Letter of July 22, 1884, from the Chief of Engineers to the honorable Secretary of War, with the Secretary's approval of July 25, 1884.

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* Not printed.

4. Letter of Chief of Engineers to Col. C. E. Blunt, Corps of Engineers, July 28, 1884.

5. Partial list of vessels wrecked between the ports of Boston and Portland, during the past fifty-five years, as compiled from the Gloucester Telegraph and News.

Respectfully submitted.

CHARLES E. BLUNT,
Colonel of Engineers.
WM. P. CRAIGHILL,
Lieut. Col. of Engineers.
WALTER McFARLAND,
Lieut. Col. of Engineers.
CHAS. W. RAYMOND,
Major of Engineers, Recorder.

Brig. Gen. JOHN NEWTON,
Chief of Engineers, U. S. Army.

LETTER OF HON. E. F. STONE.

WASHINGTON, *July* 8, 1884.

DEAR SIR: I write to call your attention to that provision of the river and harbor bill of this year, which has just passed, appropriating $100,000 for the construction of a national harbor of refuge of the first class at Sandy Bay, Cape Ann, Massachusetts; provided that a Board of Engineers shall determine that this point is the best location on the coast between Boston and Portland for such a harbor that shall serve all the uses for which it may be needed.

This is an enterprise in which I take a deep interest, and I hope that it will be convenient for you to cause a Board of Engineers to be appointed at an early day, whose duty it shall be to make the required examination without delay, and report, so that if the location should be found satisfactory the work may be entered upon at once.

I ask that when the examination is made the engineers shall consider not only the advantages of this location, as compared with others on the coast, for the construction of a national harbor of refuge of the first class, which shall meet the demands of commerce and humanity, but also the value of this location—flanking Boston Bay as it does, and commanding a long extent of coast on either side—for a naval station or rendezvous for our cruisers in case of foreign complication. It was this consideration which caused this committee, of which I was a member, to insert the words in the bill "serve all the uses for which it may be needed."

The committee believed that no harbor of this character should be constructed that did not fulfill all these conditions.

Yours, respectfully,

E. F. STONE, M. C.

To Hon. ROBERT T. LINCOLN,
Secretary of War.

LETTERS OF THE CHIEF OF ENGINEERS, UNITED STATES ARMY.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., July 22, 1884.

SIR: The act of Congress making appropriations for the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes, approved July 5, 1884, contains the following provision:

"Constructing a national harbor of refuge of the first class at Sandy Bay, Cape Ann, Massachusetts, one hundred thousand dollars: *Provided*, That a board of three engineers, to be appointed by the Secretary of War, shall decide that this point is the best location on the coast between Boston and Portland for such a harbor that shall serve all the uses for which it may be needed."

With a view to compliance therewith, I have the honor to recommend that a Board of Engineers, to consist of Col. C. E. Blunt, Corps of Engineers, Lieut. Col. William P. Craighill, Corps of Engineers, Lieut. Col. Walter McFarland, Corps of Engineers,

with Maj. C. W. Raymond, Corps of Engineers, as recorder, be constituted to assemble at Boston, Mass., upon the call of the senior member, and at the earliest practicable day that the other duties of the members will permit, to consider and report upon the location, plan, and estimates for a national harbor of refuge as provided for in the act above mentioned.

The Board should be directed to carefully examine the coast between Boston, Mass., and Portland, Me. The expenses of the Board should be paid by Maj. C. W. Raymond, Corps of Engineers, from the appropriation for the proposed work.

The journeys to be made by the members of the Board to fulfill these duties are necessary for the public service.

With your sanction the order constituting the Board will be issued from this office.

Very respectfully, your obedient servant,

JOHN NEWTON,
Brig. and Bvt. Maj. Gen.

Hon. ROBERT T. LINCOLN,
Secretary of War.

[First indorsement.]

Approved.
By order of the Secretary of War:

JOHN TWEEDALE,
Chief Clerk.

WAR DEPARTMENT, *July* 25, 1884.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., July 28, 1884.

SIR: The inclosed copy of the letter of the Chief of Engineers to the Secretary of War, dated 22d instant, referring to the river and harbor act of July 5, 1884, and recommending the organization of a Board of Engineers to consider and report upon the site for a national harbor of refuge at Sandy Bay, Cape Ann, Massachusetts, and the selection of the best side for such harbor between Boston and Portland, is transmitted you for the information and guidance of the Board of Engineers constituted by Special Order 91, Headquarters Corps of Engineers, current series, of which you are the presiding officer.

In connection with the subject there is also transmitted a copy of a letter to the Secretary of War, from the Hon. E. F. Stone, M. C., dated the 8th instant. The Board is authorized to visit such localities on the coast, between Boston and Portland, as in its judgment, may be deemed advisable and to have such examinations or investigations made as may be necessary to a proper understanding of the subject.

The expenses of the Board will be defrayed by Maj. C. W. Raymond, Corps of Engineers, from the appropriation for "constructing a national harbor of refuge of the first class at Sandy Bay, Massachusetts," &c.

By command of Brig. Gen. Newton.

Very respectfully, your obedient servant,

JOHN M. WILSON,
Lieut. Col. of Engineers, Bvt. Colonel, U. S. A.

Col. C. E. BLUNT,
Corps of Engineers, Portland, Me.

PARTIAL LIST OF VESSELS WRECKED BETWEEN THE PORTS OF BOSTON AND PORTSMOUTH DURING THE PAST FIFTY-FIVE YEARS, AS COMPILED FROM THE GLOUCESTER TELEGRAPH AND NEWS, ISSUES OF THE FOLLOWING DATES:

April 12, 1828. Telegraph and News: Schooner Atlantic, of Trenton, wrecked and towed into Sandy Bay.

May 31, 1828. Schooner America wrecked off Cape Ann.

March 14, 1829. At Eastern Point, brig Persia; total loss; nine persons perished.

March 28, 1829. Rebecca Ann, at Norman's Woe, Gloucester.

Gloucester Telegraph and News, April 3, 1830; Schooner John Howard, from Boston, ashore Saulbury Point; completely wrecked; crew saved. At Portland the storm threatened all the shipping in the harbor; 1,000 hogsheads salt were washed away. Schooner Wm. Swain went ashore at Sandy Bay; total loss.

December 11, 1830. Schooner Friendship wrecked at Sandy Bay during the past week. A brig was seen to sink off Plymouth light on Tuesday by the light-keeper.

December 11, 1830. Gloucester Telegraph and News: Schooner Sciat, of Boston ashore at Brewster, and bilged. Schooner Dromide drifted from her anchorage at Nantasket Roads and went ashore at Black Creek, near Quincy. Schooner Crusader, from Portland for Baltimore, went ashore at Great Brewster.

December 18, 1830. Steamer Orleans and brig Cynthia went ashore at Rock Harbor; cargo probably saved. Packet Algerine, high and dry. Brig Milton, from Portland for St. Domingo, ashore at Nausett Harbor and bilged; cargo probably saved. Schooner Seabird, from Newburyport for Georgetown, lost at Nausett; captain lost and two of the crew also died from exposure.

June 11, 1831. Several of our vessels were endeavoring to tow in a wrecked vessel yesterday off Brace Cove. The above was got into Sandy Bay.

February 11, 1832. Brig Fitz Owen, from New York to Portland, with cargo of steel, brandy, &c., went ashore at Andrew's Point, Sandy Bay; total loss. Finding it impossible to prevent going ashore, to save lives, drove her head on.

April 28, 1832. Schooner Free Trader wrecked off Cape Ann.

May 5, 1832. The Bangor packet was wrecked off Thatcher's Island.

January 25, 1837. Schooner Ann Maria went ashore on Thatcher's Island; total loss.

July 19, 1837. Schooner Albany, from Booth Bay, ashore on Milk Island; captain lost.

December 18, 1837. Walrus, off Pigeon Cove; all lost.

December 28, 1839. Great loss of lives. It is stated that the number of lives lost by shipwreck on Cape Ann and Cape Cod on and since Sunday, 15th instant, is greater than the whole number for the last twenty-five years. Schooner Deposit, of Belfast, lost at Ipswich; several of the crew and captain drowned; total loss. Also ship ashore at same place.

December 18, 1839. In Gloucester Harbor there are twenty-two total wrecks; thirty-two dismasted, drifted out of harbor, &c.; and twenty ascertained deaths.

Schooner Arden, with coal, wrecked on Nahant; three men lost.

December 21, 1839. Schooner Antioch, of Ellsworth, drifted out of Cape Ann Harbor, struck on Nichols Rock; total loss.

December 25, 1839. Brig Pocahontas totally wrecked at Plum Island; thirteen lives lost.

January 1, 1840. Brig Richmond, packet, of Deer Isle, corn and flour, ashore at Steep Bank, Gloucester; total loss. Captain's wife drowned.

Brig Aladdin, from Baltimore for Portsmouth, lost on Half Moon Beach.

Schooner Thetis, from Philadelphia for Portland, with coal, wrecked in Gloucester Harbor.

Schooner Bride also ashore at same place, and several other vessels wrecked and brig dismasted off Manchester.

February 19, 1842. Schooner Ruby, from Thomaston for Boston, wrecked in Gloucester Harbor; vessel and cargo a total loss. Schooner Packet, of Hamden, for Salem, wrecked at same place. Also schooners George, Accumulator, Carroll, Billow, Ivanhoe, and Fame, wrecked at Gloucester.

December 7, 1842. New bark Isadore, of Kennebunk, totally lost on the 30th ultimo, near Cape Neddock, Maine; value, $22,500, and fifteen men perished. On the same night schooner Minnie Clark was wrecked at Rye Beach and six men perished.

April 24, 1842. Schooner Fame wrecked on Avery's Rock, Sunday.

October 25, 1842. Sloop Brilliant, wrecked on Eastern Point, Friday last; total loss.

March 14, 1840. Schooner Prospect on Squam Bar; total loss with crew.

November 28, 1840. Ship Navigator, of Salem, was wrecked on Egg Rock.

December 30, 1840. Schooner Magnolia, of Gardiner, wrecked on Baker's Island, Sunday.

October 6. Editorial record of thirty-three wrecks on the cape.

November 19, 1841. Schooner Crusader wrecked on Squam Bar; a woman and two men lost. Cargo lost, valued at $5,700.

December 15, 1841. Schooner Milo, of Gloucester, totally lost on Isles of Shoals; $750 insurance.

December 18, 1841. Schooner Saloon wrecked in Old House Cove on the 16th instant; total loss.

November 27, 1844. Schooner Triumph wrecked in Gloucester Harbor.

December 14, 1844. Schooner Fannie drifted ashore at Eastern Point; total loss.

December 23, 1844. Schooner Helen Mar, from Thomaston, wrecked on flat ground; total loss, $2,500.

February 5, 1845. Brig Emerald, of Bristol, totally wrecked on Eastern Point.

April 2, 1845. Brig Amazon wrecked at Nahant.

May 21, 1845. Schooner Daniel Webster, from Ellsworth for Boston, totally lost on the cape; four persons perished. Schooner McAnor, from Bangor for Weymouth, wrecked on Squam Bar.

May 24, 1846. Schooner Royal Tarr, from Biddeford for Boston, struck Londoner on the 22d instant; total loss.

July 16, 1845. Schooner Oraldo wrecked off Half-way Rock.

November 1, 1845. Schooner Long Wharf wrecked on Farm Bar.

November 12, 1845. British schooner Cato totally wrecked on Ten Pound Island on Thursday.

November 15, 1845. Schooner Betsey was off Thatcher's Island and driven to sea in a gale. A sloop from Pigeon Cove was also blown off. Schooner Garnet was wrecked on Straitsmouth Island.

September 9, 1846. A British schooner was wrecked on Halibut Point.

September 12, 1846. Schooner Alfred, from Bangor, was wrecked off Squam Harbor on the 9th instant.

November 9, 1846. Two vessels at anchor in Gloucester Harbor dragged upon the Fort Rocks. There was also a schooner wrecked on Coffin's Beach.

November 11, 1846. Schooner Eliza, from Kennebec, was wrecked at Old Garden Beach on the 9th.

November 26, 1846. Brig Watson, of Portland, dragged her anchors and went ashore at Rocky Neck.

November 28, 1846. Schooner Equity was wrecked at Folly Cove.

December 19, 1846. Schooner Mary Howard, from Boston for Kennebec, a total loss on Ten Pound Island. The Brig Ruby was wrecked off Baker's Island the same night.

January 2, 1847. Schooner Sarah, of Freeport, ashore at Gloucester,

January 30, 1847. Schooner Santa Maria struck on Eastern Point.

March 24, 1847. Brig Susan, from Bahia for Portland, wrecked on the Salvages.

June 16, 1847. Schooner Rio Grande, of Gloucester, totally wrecked on Pebble Stone Beach, Eastern Point; value, $3,500. Schooner Everett went ashore at same place.

June 26, 1847. British schooner Tryner wrecked on the Londoner on the 22d instant.

September 29, 1847. British schooner Louise Willard, from Saint John for Boston wrecked at Ipswich.

October 16, 1847. "The blow on Tuesday night was pretty severe for a short time, and considerable damage was done among the vessels which anchored in the outer harbor." Several vessels dragged their anchors and collided, two being wrecked upon the shore.

November 27, 1847. Total loss of ship Alabama on Minot's Ledge; $97,179 loss.

December 22, 1847. Brig Falconer totally lost at Ipswich; seventeen persons perished.

Schooner Pliant, from Pembroke for Boston, wrecked on Ipswich Bar on Friday.

April 5, 1848. Schooner Marblehead, from Fredericksburg for Boston, was wrecked in Gloucester Harbor, May 10, 1848. Schooner Stephen C. Philips, from the eastward, was wrecked at Rockport on Monday, June 24, 1848. Schooner Rio Del Norte struck on Point of Rocks, Gloucester Harbor.

September 20, 1848. Schooner President wrecked on Thatcher's Island.

October 4, 1848. Two large British schooners were wrecked on Ipswich Beach.

October 21, 1848. Schooner Two Sisters, of Newburyport, was totally lost on Straitsmouth Island on the 18th instant.

November 24, 1848. Schooner Three Sisters ashore in Gloucester Harbor. Schooners Lucinda and Premium drifted ashore in Gloucester Harbor.

December 30, 1848. Schooner Lowell was wrecked on Milk Island. Schooner Willow, of Deer Isle, was wrecked on Ipswich Beach.

January 10, 1849. Schooner Warren, of Portland, was wrecked off Rockport.

January 24. 1849. Schooner Napoleon was wrecked in Gloucester Harbor.

March 31, 1849. Schooner Charles, from Calais for Baltimore, wrecked on Dolliver Neck; total loss. There was a schooner wrecked off Little Nahant the same date.

August 18, 1849. A number of vessels in Gloucester Harbor dragged their anchors; a dozen or twenty left the harbor for Salem. The schooner Wasp, of Camden, Me., was wrecked in Gloucester Harbor. Schooner Magnet was lost on the north side of the cape. British brig Saint John was wrecked on the Grampus ground; total loss. Ninety persons perished.

October 13, 1849. Schooner Auricola, of Bucksport, while lying in Gloucester Harbor, was run into by two vessels dragging their anchors; slipped her cable, and ran into Salem Harbor. Schooner Wasp was driven out of Gloucester Harbor on Sunday.

December 8, 1849. Brig Argenovia struck on Black Rocks, Gloucester.

December 15, 1849. Schooner Clemantine was wrecked on Straitsmouth Island.

December 22, 1849. Schooner Post Boy, from Addison for Boston, was totally wrecked on Eastern Point.

December 29, 1849. Schooner Commodore, from Norwich to Boston, was wrecked on Ipswich Beach.

Schooner Nancy, of Wiscasset, was wrecked on Plum Island about the 1st of December.

March 23, 1850. Schooner Banner, from Bath for Boston, was wrecked off Rockport, Thursday.

April 6, 1850. Schooner Pearl, from Portsmouth, was wrecked on Essex Bar; all perished.

April 24, 1850. Steamer Ocean struck a rock off Rockport, causing her to leak badly.

April 30, 1850. Schooners Packet, Corrinne, and Georgianna are ashore in Gloucester Harbor.

October 5, 1850. Schooner Fin Back, of Cohasset, was wrecked on Black Rocks, Gloucester.

October 12, 1850. Schooner Star was wrecked in Gloucester Harbor (9th).

October 30, 1850. Schooner Harp, of Freeport, was wrecked off Rockport.

December 29, 1850. Schooner Argus, of Frankfort, was wrecked on Plum Island; all hands lost but captain.

A Machias schooner was wrecked at Saulbury Beach and two men were lost.

February 26, 1851. Brig Aerial drifted ashore at Rock Neck on the 25th.

April 19, 1851. Schooner Token totally wrecked in Gloucester Harbor, and schooner Hope was wrecked at Lane's Cove.

September 6, 1851. Sloop Julia Ann wrecked at Sandy Bay; total loss.

October 29, 1851. Schooner Globe is ashore in Gloucester Harbor.

November 22, 1851. Schooner Oread, from Lubec, dragged ashore on Stage Rocks, and is a total loss; $1,200.

Schooner Ligona, of Deer Isle, dragged ashore near Stage Fort; total loss.

Brig Lillian was wrecked on Ten Pound Island.

December 3, 1851. British brig Hope wrecked on Londoner; total loss.

March 3, 1852. Schooner George Evans, from East Machias for New York, wrecked on Straitsmouth Island.

April 17, 1852. Schooner Mary, of Wilmot, Nova Scotia, total wreck at Folly Cove, Cape Ann.

April 24, 1852. Brig Spartan, from Surinam for Boston, totally wrecked on Plum Island; $10,000.

September 25, 1852. Schooner Grace Darling wrecked on the Londoner the 23d.

November 15, 1852. Schooner Francis wrecked off Thatcher's Island; all lost.

December 15, 1852. Schooner Active wrecked at Essex Bar (12th instant).

January 6, 1854. Schooner Mary, from Charlotte, N. C., for Boston, went ashore at Rocky Neck.

April 5, 1854. Schooner R. C. Parsons ashore on Chelsea Beach.

September 13, 1854. Schooner C. H. Sampson, from Georgesown, S. C., for Bath, wrecked off Thatcher's Island. Schooner Fame, of Millsbury, for Boston, wrecked near Straitsmouth Island, Sunday.

September 30, 1854. Schooner Talent wrecked at Sandy Bay.

December 4, 1854. Schooner Susan, from Canso, totally wrecked at Gloucestor; loss $6,500. Schooner Hector ashore at Rocky Neck, Gloucester. Schooner May Queen ashore on Point of Rocks, Gloucester.

December 23, 1854. British schooner Belmont, from Windsor for Boston, totally lost off Cape Ann.

February 10, 1855. An unknown bark went ashore on Plum Island.

March 14, 1855. Schooner Hannah Fitts, wrecked on South Breakers, Newburyport; captain lost.

May 2, 1855. Schooner Caroline, from Bath for Boston, ashore at Kettle Cove, Cape Ann.

August 11, 1855. Schooner Paragon, of Scituate, wrecked at Rockport.

August 15, 1855. Schooner Challenge ashore at Marblehead.

September 1, 1855. Schooner Eagle, from Bucksport, wrecked on Thatcher's Island.

October 31, 1855. Schooner Starr King ashore on Pavilion Beach, Gloucester.

November 17, 1855. Schooners Dusky, Sally, and Don Quixote wrecked off Rockport.

November 24, 1855. Five vessels ashore in Gloucester; November 28, five other vessels ashore in Gloucester.

December 8, 1855. Brig Nautilus wrecked off Rockport.

December 12, 1855. British schooner Lioness ashore in Gloucester Harbor.

March 1, 1856. Schooner Louisiana, of Newburyport, total wreck on Straitsmouth Island.

March 29, 1856. Two schooners ashore at Ten Pound Island.

April 19, 1856. Schooner Argyle wrecked off Gloucester Harbor.

July 9, 1856. Steamer M. Sanford, from Boston to Bangor, ashore on Thatcher's Island.

August 16, 1856. British bark Adien, from Glasgow for Boston, wrecked on Little Salvages.

August 23, 1856. Schooner Convoy, of Bath, wrecked on Milk Island. Schooner Catherine wrecked on Long Beach, Cape Ann. Schooner Mary Snow, from Lubec, wrecked in Squam Bar. Schooner Wm. Henry total loss on Coffin's Beach.

October 4, 1856. Schooner Mist total loss on Milk Island; $3,000.

November 12, 1856. Schooner Marion, of Tremont, Me., wrecked on the Londoner.

December 3, 1856. Schooner Enchantress,.of Mount Desert, Me., wrecked on Rocky Neck.

December 6, 1856. Schooner Curlew, of Pittston, for Boston, wrecked off Rockport.

January 21,1857. Ship California and schooner Nile driven out of Gloucester Harbor; ship and cargo total loss; $60,000. Schooner Trader total loss on Ten Pound Island. Schooner Queen of the Cape ashore on Ten Pound Island. Schooner West Gleam ashore on Ten Pound Island. Several other vessels dragged their anchors, and were greatly damaged by collision. Schooner Harp total loss at Rockport. Brig Swan, from West Indies for Portland, total loss, $20,000, on Cape Ann. Schooner Zepher wrecked at Lanesville.

January 24, 1857. Bark Tedesco, from Cadiz for Boston, lost with all hands at Swampscott. A hermaphrodite brig total loss on Milk Island. Seven other vessels wrecked along the cape.

April 22. 1856. Schooner Loella, from Bristol for Gloucester, wrecked on Plum Island.

May 27, 1857. Schooner Diadem, of Northport, wrecked in Gloucester Harbor.

June 24, 1857. Sloop Pigeon Hill ashore on Eastern Point. Schooner Peru wrecked off Rockport.

July 4, 1857. Schooner Priscilla total loss on Norman's Woe.

July 25, 1857. Schooner Cion, from Rockland for Boston, total loss off Annisquam.

December 23, 1857. Schooner Charles Parker, of Philadelphia, ashore in Gloucester Harbor.

February 24, 1858. Schooners Alfred F. Howe and Know Nothing ashore in Gloucester Harbor.

March 13, 1858. Schooner Ocean Bride ashore on Long Beach.

September 15, 1858. Schooner Sierra Nevada, from Philadelphia for Portland, total loss on Eastern Point; $9,000.

October 27, 1858. Schooner Lucy Ellen total loss on South Breaker, Newburyport. Schooner Ranger wrecked in Ipswich Bay.

December 8, 1858. Schooner Billow, from Addison to Boston, ashore near Straitsmouth Island.

January 8, 1859. Schooner Kosciusko wrecked on Rocky Neck, Gloucester Harbor.

February 5, 1859. British bark Vernon, from Messina, wrecked on Lynn Beach. British schooner Caroline wrecked at Deer Island.

September 17, 1859. Brig Cronstadt and schooner Boston Light ashore at Gloucester.

September 21, 1859. Schooner Angler, of Beverly, with valuable cargo, total loss on Marblehead Neck.

September 24, 1859. Sloop Hetta, from Rockland for New York, ashore in Gloucester Harbor. British schooner John Bull total loss on Thatcher's Island.

December 7, 1859. Schooner Prudence total wreck, Brace's Cove, Gloucester; loss, $1,400. Schooner Magellan wrecked on Annisquam Point. Schooner Victoria wrecked off Lanesville.

December 10, 1859. Schooner John P. Ober ashore in Gloucester Harbor. Brig Clara wrecked off Rye Beach.

May 23, 1860. Schooner Boxer, of Wells, ashore at Brace's Cove, Gloucester.

June 9, 1860. Schooner Little Mary, from Bristol, wrecked off Annisquam.

August 18, 1860. Schooner Samuel Wonson ashore in Gloucester Harbor.

October 10, 1860. Schooner Angeretta total loss, $2,000, at Rockport.

October 17, 1860. Schooner John ashore at Annisquam.

November 14, 1860. Schooner Gazelle wrecked at Swampscott.

November 28, 1860. Schooner Convoy wrecked on Misery Island on the 16th.

December 8, 1860. Schooner M. S. K. Thorne ashore at Lanesville. Schooner Alice ashore at Rocky Neck, Gloucester.

January 26, 1861. Schooner R. C. Mahoney total loss, $1,500, near the entrance to Gloucester Harbor.

February 6, 1861. Schooner Boxer lost on Ten Pound Island, Gloucester Harbor; captain drowned. Schooner Edith May total loss on Salvages.

February 20, 1861. Schooner Telegraph wrecked on Norman's Woe.

March 9, 1861. Schooner Serena Ann ashore at Rocky Neck, Gloucester Harbor.

March 13, 1861. Schooner Electric Spark ashore on Phillips Beach, Swampscott.

March 23, 1861. Ashore in Gloucester Harbor, ship Newburyport, schooner D. B. Gale, schooner M. D. Babson, schooner Hibernia total loss; brig Catherine Beals.

March 30, 1861. An unknown schooner lost off Rockport with all hands.

November 6, 1861. Newburyport pilot boat wrecked off Eastern Point, Gloucester. Ship Maritainer, from Liverpool, lost off Boston Light with all hands.

January 1, 1862. Schooner Grace Brown, Boston for Trenton, wrecked off Thatcher's

Island. Two unknown vessels lost off Thatcher's Island. United States cutter Howell Cobb total loss off Lanesville.

January 4, 1862. Schooner Mary Jane, of Boston, lost on Plum Island.

November 12, 1862. British schooner Boston, from Cornwallis, total loss, on Straitsmouth Island. Schooner T. S. Harding wrecked at Straitsmouth Island.

November 29, 1862. Schooner Brilliant, of Bristol, ashore at Rockport.

December 3, 1862. Schooner John Snow wrecked near Thatcher's Island.

December 10, 1862. Schooner Iowa total loss off Rockport.

January 28, 1863. Schooner Foam wrecked on Nipper Stage Point, Gloucester; loss $1,000.

February 25, 1863. Schooner Mary E. Hiltz total loss, $3,500, off Marblehead Light; one man lost.

June 3, 1863. Schooner Medora wrecked off Cape Ann.

July 15, 1863. Schooner Boston Packet, from Hampden, total loss at Brace's Cove, Gloucester. Schooner Evangeline wrecked off Thatcher's Island.

July 27, 1864. Schooner Gazette wrecked on the Londoner.

October 12, 1864. British schooner Cather total loss at Rockport.

November 16, 1864. Schooner Python went ashore in Gloucester Harbor on the 4th.

December 14, 1864. Schooner Splendid, from Portland for New York, wrecked on Plum Island. Schooner Lion total loss on Nahant Beach; all hands lost.

December 21, 1864. Schooner Iris wrecked on Ipswich Beach. An unknown schooner ashore at Brace's Cove.

December 28, 1864. Schooner H. E. Bishop wrecked on Bemo Ledge, off Gloucester; loss, $30,000.

April 8, 1865. Sloop Good Intent wrecked off Thatcher's Island.

September 23, 1865. Brig Vincennes wrecked on Annisquam Bar; total loss with cargo.

October 14, 1865. Boston packet, from Wells, Me., total loss at Rockport.

November 22, 1865. Schooner Larch total loss in Gloucester Harbor.

January 3, 1866. Brig C. M. Carver wrecked off Cape Ann.

April 4, 1866. Schooner Benj. Haskell ashore in Gloucester Harbor.

May 2, 1866. Schooner Angelica, with cargo, total wreck, Long Beach, Manchester.

July 28, 1866. British schooner Ellen, from Arichat for Rockport, with cargo, total loss on Avery's Rock.

August 18, 1866. Schooner Flying Fish ashore at Rockport.

September 18, 1866. Schooner Mary Francis, from Bucksport for boston, with cargo, total loss at Brace's Cove.

September 22, 1866. Schooner Georgiana ashore on ledge of rocks off Manchester.

September 26, 1866. British brig Elba, of Windsor, total loss ($15,000) on Ten Pound Island, Gloucester.

October 10, 1866. Schooner William total wreck on Whale's Back, entrance to Salem.

October 27, 1866. Schooner Mariner ashore on Salvages.

October 31, 1866. Schooner Bangor, of Dennysville, Me., ashore in Gloucester Harbor.

March 6, 1867. British schooner Julia totally wrecked on Eastern Point, Cape Ann, Sanuary 17.

August 21, 1867. Schooner Onward wrecked in Gloucester Harbor.

September 7, 1867. Schooner Araba wrecked off Rockport.

September 28, 1867. Schooner Glide wrecked off Thatcher's Island.

October 2, 1867. Schooner Ada F. Lowe total loss off Rockport; one man lost. Schooner Sarah Hall, of Stockton, wrecked Tuesday on Salvages. Schooner Glide, of Bangor, wrecked off Thatcher's Island.

October 16, 1867. Schooner Eurotus, of Rockland, Me., wrecked at Steep Bank, Rockport.

November 9, 1867. Schooner New Zealand wrecked off Essex. Schooner Challenge wrecked off Gloucester.

December 14, 1867. Schooner Superior, of Rockland, total loss off Cape Ann.

NOTE.—We have no list of wrecks that have occurred in this section from 1868 to 1874. Those that follow were taken from the custom-house record and is an incomplete list of those that have happened on Cape Ann.

September, 1874. Schooner Coral wrecked off Rockport.

January 24, 1875. Schooner Annie E. Lane wrecked at Good Harbor Beach.

February 26, 1875. Schooner William H. Foye wrecked on Ten Pound Island, Gloucester.

March 4, 1875. Schooner Sea Lion wrecked at Rockport.

April 14, 1875. Schooner Welaka total wreck at Bay View.

November 22, 1875. Schooner Wm. Hill total wreck on Pigeon Cove shore.

October 9, 1877. Schooner High Flyer wrecked on Ten Pound Island, Gloucester.

October 9, 1877. Schooner Star of the East wrecked at Brace's Cove, Gloucester.

November 7, 1877. British schooner Avon wrecked at Gloucester Harbor.
December 13, 1877. British schooner Volent nearly total wreck on Pavilion Beach, Gloucester.
January 4, 1878. Schooner Julia Newhall wrecked at Long Beach, Gloucester; loss, $7,500.
March 20, 1878. Schooner Enterprise wrecked off Annisquam Light; loss, $1,800.
June 18, 1878. Schooner Sea Bird wrecked on Milk Island.
July 5, 1878. Schooner Orinoco total loss on Straitsmouth Island.
September 4, 1878. Schooner Ripple ashore at Gloucester.
November 24, 1878. Schooner Addie ashore at Long Beach.
December 22, 1878. Schooner Waterloo dragged ashore in Gloucester Harbor; loss, $1,600. Tern schooner Emma C. Babcock dragged ashore in Gloucester Harbor; loss, $6,000.
December 28, 1878. Schooner Levanter stranded at Gloucester Harbor.
May 7, 1879. Schooner Admiral stranded at Rocky Neck, Gloucester.
August 17, 1879. Schooner E Pluribus Unum stranded on Annisquam Flats.
November 3, 1879. Schooner Addie Emma on Eastern Point, Gloucester.
November 6, 1879. Schooner Ernest Norwood on Ten Pound Island, Gloucester.
February 3, 1880. Schooner J. W. King wrecked at Brace's Cove, Gloucester; loss, $4,422. Schooner Abbie Bursley total wreck at Lanesville; loss, $7,000.
February 6, 1880. A. F. Haynes stranded near Thatcher's Island.
March 13, 1880. Schooner Northern Star off Thatcher's Island; loss, $1,500.
March 21, 1880. Schooner Paul Revere ashore at Brace's Cove; loss, $2,600.
June 8, 1880. Schooner Benjamin Haskell stranded, Gloucester Harbor.
July 28, 1880. Schooner Edith Conley ashore on Avery's Rock; loss, $700.
November 20, 1880. Sloop Bee total loss on Eastern Point.
February 28, 1881. Bark Brothers total wreck on Eastern Point; loss, $58,000.
April 7, 1881. Steamer S. B. Jones ashore in Gloucesster Harbor.
June 8, 1881, British schooner Dauntless total wreck on Halibut Point.
September 16, 1881. Schooner Admiral on Ten Pound Island; loss, $3,300.
February 11, 1882. Schooner Bunker Hill on Bemo Ledge, off Gloucester Harbor; loss, $6,000.
February 21, 1882. Schooner Henry Elsworth dragged ashore in Gloucester Harbor.
February 22, 1882. Schooner Cora, Wheeler's Point, Gloucester.
September 15, 1882. Schooner W. P. Ritchie at Rockport; total wreck.
March 21, 1883. Schooner C. P. Thompson ashore on Ten Pound Island.
March 25, 1883. Schooner Samuel Gilman total loss ($3,500) on Straitsmouth Island.
June 26, 1883. Schooner Clarabel total loss ($4,100) on Avery's Rock.
September 24, 1883. Isaac A. Chapman, loss ($13,200) at Good Harbor Beach.
The following are vessels wrecked in Sandy Bay during the past ten years, for which we have no dates:

Schooners W. H. Dennis, Sophie Parker, F. J. Cummings, Lucy Very, Crescent Lodge, Jennie Lind, October, D. & E. Kelley, Bay Queen.

LETTER TRANSMITTING REPORT OF BOARD OF ENGINEERS.

UNITED STATES ENGINEER OFFICE,
Portland, Me., December 11, 1884.

GENERAL: I have the honor to transmit to-day to the Department the following:

Report of the Board of Engineers convened by Special Orders No. 91, Corps of Engineers July 26, 1884, for consideration of the subject of a national harbor of refuge of the first class at Sandy Bay, dated November 20, 1884.

This report includes, as a part thereof, a report to said Board by Maj. C. W. Raymond, Corps of Engineers (district engineer) and certain tables therein referred to.

I mail also, on a separate roll, certain drawings referred to by Major Raymond, and forming part of his report to the Board, viz:

Coast Survey chart of Gloucester Harbor with additions, tracing coast between Portland and Boston.

Tracing Sandy Bay maps, with suggested interior breakwater lines.
Tracing showing suggested harbor near Thatcher's Island.

Very respectfully, sir, your obedient servant.

CHAS. E. BLUNT,
Colonel of Engineers, Senior Member of Board.

Brig. Gen. JOHN NEWTON,
Chief of Engineers, U. S. Army.

REPORT OF BOARD OF ENGINEERS.

BOSTON, MASS., *November* 20, 1884.

GENERAL: The Board of Engineers constituted by Special Orders No. 91, headquarters Corps of Engineers, U. S. Army, dated Washington, D. C., July 26, 1884, "to consider the location, plan, and estimates for a national harbor of refuge of the first class, at Sandy Bay, Cape Ann, Massachusetts," and reconvened by Special Orders No. 155, Headquarters Corps of Engineers, U. S. Army, Washington, D. C., November 7, 1884, have the honor to present the following report supplementary to their report of August 22, 1884.

In that report it was recommended that "further study be given by Major Raymond to the consideration of the practicability and cost of construction of a harbor of smaller area at Sandy Bay, with a view mainly to a reduction of expense, and that in connection therewith he examine the question of constructing a smaller harbor at the southeast point of Cape Ann, as well as the improvement of the harbor at Gloucester, which would be effected by a breakwater on the bar at its mouth.

He was requested, also, to procure "additional information as to the number and circumstances of the wrecks which have occurred in the past few years at or near Cape Ann, the number and classes of vessels passing that point, that point, the annual loss of life and property," &c.

Since the date of the preliminary report, Major Raymond has made the studies recommended by the Board and has collected the information called for so far as it was possible to do so. His report, dated November 19, 1884, is transmitted herewith.

From the additional information so furnished the Board have arrived at the following conclusions:

1st. That no reduction in the size of the proposed harbor at Sandy Bay, by carrying the breakwater nearer to the shore can be effected without reducing the anchorage capacity in a very much greater degree than the cost of construction will be reduced; or without rendering the approaches to either entrance so much more dangerous that it is inexpedient to make such change.

The Board, therefore, re-affirm the opinion expressed in its report of August 22, 1884, that if "a national harbor of refuge of the first-class" is to be constructed, the lines originally recommended for it by Major Raymond, at Sandy Bay, are the best that can be adopted.

Recurring, however, to Major Raymond's original report of November 28, 1883, the Board emphasize the following paragraph:

> The principal objection to this location is that the southern portion of the breakwater will receive the maximum effort of the sea in a direction perpendicular to its length. It seems better, however, to strengthen the profile rather than forfeit the advantages which attach to the occupation of this line.

2d. If, as suggested by the Board in their preliminary report, the idea of constructing "a national harbor of refuge of the first class" in this vicinity be abandoned on account of the useless expense which it would involve, and a smaller harbor of refuge for commercial uses only be substituted, the Board are of the opinion that the interest of commerce will be best subserved by the formation of an artificial harbor at the southeast point of Cape Ann, by constructing breakwaters from Thatcher's Island to Milk Island, and from each of these islands towards the shore, with suitable entrances.

This would furnish anchorage in water from 12 to 35 feet deep for about one hundred and fifty vessels of the classes which would most commonly make use of it, according to the allowance of 1½ acres for each, given in the preliminary report of the Board.

The estimated cost of this harbor, according to the views of the Board, is about $1,000,000, which is about one-fifth of the amount which they estimated as the cost of the proposed harbor at Sandy Bay.

The special advantages which a harbor here would offer are: 1st. That the site is already well known to navigators, and is well marked and lighted by the Cape Ann or Thatcher's Island lights—two conspicuous lights of the first order. 2d. That it is close to the track of vessels passing along the New England coast bound to and from Boston. 3d. It would be safe and easy of ingress and egress in all weathers. 4th. Even with one breakwater extending westwardly from Thatcher's Island, cutting off the most dangerous seas, which come from the northeast, valuable refuge would be gained.

By omitting a part of the breakwater between Milk Island and Emerson's Point, and by leaving an opening through the breakwater between Thatcher's Island and Milk Island, space enough would be left for the sea by its action to prevent the harbor from becoming obstructed by ice, and a more convenient entrance for coasters would be afforded.

The area of the proposed harbor at Thatcher's Island being so much less than that at Sandy Bay, it is worthy of notice that that area could be greatly increased by placing farther north the breakwater attached to the westerly side of the island. This extension would, of course, much increase the cost.

With reference, also, to the more limited area at Thatcher's Island, the harbor of Gloucester should be taken into the account as supplementary thereto. It is already an excellent harbor, and is but a few miles from Thatcher's Island. Under certain conditions of the wind, the harbor of Gloucester is dangerous to vessels already in it, and this is plainly demonstrated by experience, as Major Raymond's tables show. This danger would be almost entirely removed by building breakwaters on or near the lines proposed by Major Raymond. The cost of the Thatcher's Island harbor added to that of the improvement at Gloucester would not be more than half that of the large harbor at Sandy Bay. The harbor of Gloucester is also dangerous during the season of heavy ice. This season is, however, short in every year, and at all other seasons the harbor is very valuable, and its value would be increased by the proposed breakwaters. In this connection the date of availability is an important element. The harbor of Gloucester is already available; that proposed at Thatcher's Island can be made valuable by the construction of its northern breakwater alone in a short time. A great harbor at Sandy Bay will be available only when essentially completed. This cannot be expected for very many years.

A study of the statistics procured by Major Raymond as to the number of vessels passing Cape Ann, will, in the opinion of the Board, es-

sentially sustain the estimate of their preliminary report, as to the amount of anchorage room needed for a commercial harbor.

Major Raymond gives elaborate tables of wrecks (total and partial) during the past ten years, along the whole line of coast between Portland and Boston. It is clear that but a small proportion of them would have been prevented by a harbor of refuge at Cape Ann. Smaller harbors at various points would certainly be required.

Respectfully submitted.

CHAS. E. BLUNT,
Colonel of Engineers.
WM. P. CRAIGHILL,
Lieutenant-Colonel of Engineers.
WALTER McFARLAND,
Lieutenant-Colonel of Engineers.

Brig. Gen. JOHN NEWTON,
Chief of Engineers, U. S. Army.

REPORT OF MAJOR CHARLES W. RAYMORD.

UNITED STATES ENGINEER OFFICE,
Boston, Mass., November 19, 1884.

COLONEL: In accordance with instructions of the Board of Engineers having under consideration the location, plan, and estimates for a national harbor of refuge at Sandy Bay, Cape Ann, Mass., I have the honor to submit the following report of investigations connected with the subject with which the Board is charged. I was instructed by the Board as follows:

1. To investigate the practicability and cost of construction of a harbor of smaller area at Sandy Bay, with a view mainly to a reduction of expense.

2. To examine the question of constructing a smaller harbor at the southeast point of Cape Ann.

3. To inquire into the improvement of the harbor of Gloucester, which would be effected by a breakwater on the bar at its mouth.

4. To collect and tabulate the number and circumstances of the wrecks which have occurred in the past few years at or near Cape Ann, the number and classes of vessels passing that point, and the amount of loss of life and property, &c.

In this report the subjects above enumerated will be considered separately, and in the order named.

In the examination of the various harbors to be investigated, the theoretical anchorage capacity has been calculated by the formula $Ns=1+0.000073\ A+0.004\ P$, in which Ns represents the maximum number of vessels, each occupying a linear distance of 126 feet, which can anchor and swing clear of each other within the harbor; A represents the "corrected area" in square feet; that is, the area of the anchorage basin diminished by the area of a belt around its edge the width of which is three times the depth plus unity; and P represents the length of the anchorage limit or boundary of the corrected area. This formula is a special case of the general formula $Ns=\frac{1+1.155\ A}{r2}+\frac{P}{2r}$ (in which r represents the linear distance occupied by a single vessel) which is deduced and fully discussed in my letter to the Chief of Engi-

neers dated October 11, 1884. In this special case the value $r=126$ has been determined from experience at Gloucester Harbor.

As explained in my letter to the Chief of Engineers above referred to, the value of r is the length of the anchoring vessel plus three times its draught. The special value above employed is the mean by weights of the value of r computed from the known dimensions of vessels actually anchoring in Gloucester Harbor.

It is important to notice that the formula determines "the *maximum* number of ships of standard length and draught which can conveniently anchor in a sheltered harbor having a given corrected area and perimeter." Although the results of this formula are confirmed by observation, it is of course desirable to make a somewhat more liberal allowance of space in planning a harbor to accommodate a given number of ships. For the purpose of comparing relative anchorage capacities the results obtained from the formula require no correction.

The land-shelter from wind has been determined by selecting in each case a central position in the harbor and drawing the limiting lines therefrom.

1. *Practicability and cost of construction of a smaller harbor at Sandy Bay.*—My investigation of this subject is based upon the original map of the Coast Survey of 1857. Owing to the general uniformity of the bottom the soundings given are believed to be sufficiently numerous for this purpose; and it was therefore thought unnecessary to incur the expense of additional surveys. No line starting from Avery's Ledge, and interior to the line proposed in my report of November 28, 1883, need be considered, as any such line will be more expensive than the one proposed, owing to the necessity of crossing the deep "Haddock Hole."

Two interior lines have been investigated. They are marked A and B, respectively, on the sketch herewith transmitted.

Line A is the line selected for examination by the Board at its last session. A breakwater on this line will inclose a high-water area of 636 acres, or about two-fifths that of the harbor originally proposed. The average depth at mean low water is 47 feet, that of the harbor originally proposed being 60 feet. The theoretical anchorage capacity of this harbor is 1,135 vessels, or about three-tenths that of the originally proposed harbor. The holding ground is equally good. Both entrances are, in my opinion, extremely dangerous. In facility of entrance and departure this harbor is greatly inferior to that originally proposed. The motion of the tidal currents through this harbor will not be so free as in the case of the harbor originally proposed. Some trouble from ice may be anticipated. This harbor has land-shelter from the wind through an angle of 241°. The harbor originally proposed is sheltered through an angle of 203°.

The bottom along this line being sand and mud, the foundation for the breakwater is not nearly as good as in the case of the line originally proposed. Considerable settling must be expected.

A breakwater along this line will be more favorably situated as regards exposure to the action of the sea than the one originally proposed, since the burst of water between the out-lying ledges is avoided.

The length of this line being 6,000 feet, is 3,050 feet shorter than that of the line originally proposed, which is 9,050 feet. The average depth at mean low water on the former is 67 feet, while on the latter it is only 57 feet. The cost of a breakwater on line A is estimated at $3,055,000, while on the old line the cost is estimated at $4,000,000. No allowance, however, has been made for settling, as I have no data on which to

base an estimate. It will doubtless greatly increase the cost of construction on the new line.

Line B is drawn so as to reduce the average depth on the axis of the breakwater to that on the line originally proposed. The high water area inclosed is 448 acres, or about one-fourth that of the harbor originally proposed. The average depth at mean low water is 41 feet. The theoretical anchorage capacity of this harbor is 709 vessels, or about one-fifth that of the originally proposed harbor. The holding ground is good.

The eastern entrance is the same as for line A. The northern entrance is even more dangerous than in the case of line A. Trouble from ice may be anticipated. The harbor has land shelter from the wind through an angle of 246°.

The bottom along the axis of the breakwater is the same as on line A, and settling must be expected.

As regards exposure to the violent action of the sea, this line appears to me to be little better located than line A. The length of this line is 4,250 feet, the average depth at mean low water being 57 feet.

The cost of a breakwater on line B is estimated at $1,878,000, or less than one-half the cost on the line originally proposed. No allowance has been made for settling.

The above general comparison will, I trust, sufficiently indicate the relative characteristics of the proposed harbors. The question of facility of ingress and egress is, however, so important that it requires a closer examination.

The harbor originally proposed can be entered with the wind from any direction. To the northern entrance the course can be laid from S. SE. around to W., clearing Andrew's Point and Flat Ground. To the eastern entrance the course from W. around to N. NW. clear the Salvages and the reef from Straitsmouth Island. Thus we have straight courses with no dangers—to the northern entrance, 112½° (ten points), and to the eastern entrance 67½° (6 points).

The exit is equally favorable. As soon as the vessels have passed the pier-heads of the breakwater they are in the open sea. This is not the case with the interior lines. Line A has a northern entrance with courses from S. by W. to W. by S., or 67½° (6 points). Thus for this interior harbor there is a reduction in entering courses from 180° to 78¾°, or from 16 points to 7 points. More than half the winds will be unfavorable for making the harbor. Moreover, in approaching the northern entrance with a NE. wind a mile of rocky lee-shore must be passed. As for the eastern entrance, we have not only the rocky shore on the south, the narrow opening between Avery's Ledge and Straitsmouth Island must also be passed through. Unless a pier or beacon is built on Avery's Ledge, this entrance will be of little practical value. Three vessels were wrecked on this ledge between September 24 and October 9 of the current year.

The northern entrance for line B is still more unsatisfactory. It is practically useless on account of the groups of sunken ledges, known as Mitchell's, Bartlett's, and Dodge's Rocks, which are directly opposite the pier-head. Even in the case of line A these rocks would be a very serious danger unless piers are erected upon them.

These considerations confirm me in the opinion that the best line for the construction of a breakwater in Sandy Bay is the line recommended in my report of November 28, 1883. To this line there are doubtless objections, the principal one being the exposure of its right wing to the

violent action of the sea; but the objections to the interior lines are, in my opinion, so serious as to put them out of the question.

2. *Practicability and cost of construction of a smaller harbor at the southeast point of Cape Ann.*—As a basis for this investigation a detailed hydrographic survey of the area included between the Cape and Thatcher's and Milk Islands has been made under my direction by Mr. Sophus Haagensen, assistant engineer. A map of this survey, showing in plan the projected breakwaters, is herewith submitted.

The breakwaters are simply enrockments of granite rubble, their crests rising to a level of 8 feet above mean high water. The inward slopes are 1 on 1, and the seaward slopes 1 on 2. This method of construction has been adopted because there is plenty of stone near at hand at Emerson's Point, and because the material can by placed in position by cars run out on the breakwater from the shore, passing over Milk and Thatcher's Islands. The entrance is at the northwest corner of the harbor, between Oak's Rock and Emerson's Point. It is 1,200 feet wide. The harbor thus formed contains a high-water area of 283 acres, with an average depth of 24 feet at mean low water. Its theoretical anchorage capacity is 506 vessels.

The bottom consists of sand, cobble-stones, and bowlders, with occasionally a little clay. In some places the holding ground is good, but it is nowhere as good as in the proposed harbor at Sandy Bay.

As regards facility of entrance and departure it is evidently very defective; yet an additional entrance cannot be constructed without involving great expense in dredging and seriously reducing the anchorage capacity. There being no through current, there will doubtless be trouble from ice. This harbor has land shelter from the wind through an angle of 120°. The bottom along the line of the breakwater, consisting of cobble-stones and bowlders resting on the underlying ledge, furnishes a good foundation.

Of these breakwaters the one connecting Thatcher's Island and Oak's Rock is most exposed to the violent action of the sea; but even this is much more favorably located as regards this point than the right wing of the original line in Sandy Bay.

The aggregate length of the line of breakwater is 7,545 feet. The average depth at mean low water is 17.8 feet. The cost of construction is estimated at $870,000.

3. *Improvement of the harbor at Gloucester by the construction of a breakwater on the bar at its mouth.*—This project was examined by the late Lieutenant-Colonel Foster, Corps of Engineers, and his report thereon is given in full in the Annual Report of the Chief of Engineers for 1871, p. 869. He proposed to build a breakwater upon the summit of the ridge of Dog Bar, the eastern end being thrown back so as to connect with the shore near the quarries from which the material was to be obtained. This project was based upon surveys under Lieutenant-Colonel Foster's direction, by Messrs. H. F. Bothfield and A. Boschké, assistant engineers.

These surveys have been employed as the principal basis of the present study. The line adopted nearly coincides with that of Lieutenant-Colonel Foster for a distance from the shore of 1,300 feet. From this point the breakwater is carried on a straight line within Round Rock Shoal, to avoid a concave exposure to the sea.

The under-structure of the breakwater is an enrockment of granite rubble having its top at the level of mean low water. Its inward slope is 1 on 1 and its seaward slope 1 on 2. The superstructure is a granite

wall with concrete filling, 10 feet wide at the top, and rising 8 feet above mean high water. The location and cross-section of the breakwater are shown on the map herewith submitted.

The harbor thus inclosed contains a high-water area of 1,575 acres, with an average depth at mean low water of about 26 feet. Its theoretical anchorage capacity is 3,165 vessels, or about 0.94 that of the proposed harbor at Sandy Bay. The entrance is 2,500 feet wide. It can be safely made with winds from E. SE. around to W. With winds from N. NW. around to E. by N., it is difficult and at times impracticable for sailing vessels. It thus appears that the harbor cannot be safely entered when the most dangerous winds are blowing.

Near the middle of the entrance the Coast Survey Chart shows a rocky shoal having over it a depth of 17 feet at mean low water. The upper part of the harbor is rendered somewhat dangerous by Ten Pound Island Ledge and the Field Rocks.

There has always been much trouble from ice in this harbor. It is feared that the construction of the breakwater will increase the difficulty, preventing the free motion of the ice out of the harbor with the ebb currents.

The harbor has land shelter from the wind through an angle of 285°. In this respect it is by far the best sheltered of all the harbors considered.

The bottom along the line of the breakwater is coarse sand and shingle, resting upon the underlying ledge, and furnishes a good foundation. As regards the violent action of the sea, the breakwater is much more favorably situated than either of those projected for Sandy Bay.

The length of the proposed line is 4,000 feet, the average depth being 17.4 feet at mean low water. The breakwater can be very conveniently constructed from the shore. Its estimated cost is $752,000.

The most serious defect of Gloucester Harbor at the present time is that it is open throughout its whole extent to the full sweep of the sea in southwest storms. This has resulted in the wreckage of many vessels while lying in the harbor. This defect will not be fully remedied by the construction of the proposed breakwater. To make the shelter complete a second breakwater is required projecting from the west shore through Norman's Woe, as shown on the map. Such a breakwater would, however, contract the angle of entrance to the harbor, and perhaps further check the outward passage of the ice.

The line projected for this breakwater is 3,250 feet in length. The foundation is good. The proposed method of construction is the same as for the other breakwater. Its estimated cost is $607,000.

The characteristic features of the projected harbors above examined are exhibited in a condensed form in the following table, in which the data for the computation of theoretical anchorage capacity are also given. The figures relating to Provincetown Harbor are introduced for purposes of comparison:

Designation.	Length of breakwater.	Average depth at mean low water on axis.	Mean depth at mean low water in harbor.	Area inclosed.				Perimeter of corrected area.	Ns=number of vessels to be anchored, $l + 3d = 126'$.	Cost of breakwater.	Ratio of cost (proposed breakwater=1,000.	Ratio of anchorage capacity.	Cost of anchorage for one vessel.
				On mean high water line.	On 12-foot contour.	Corrected area (l + 3 D taken from 12′ area.							
	Ft.	*Ft.*	*Ft.*	*Ac.*	*Ac.*	*Ac.*	*Sq. ft.*	*Ft.*					
Proposed breakwater	9,050	57	60	1,664	1,260	1,117	48,600,000	32,820	3,672	$4,000,000	1,000	1,000	$1,089
Line A	6,000	67	47	636	432	330	14,390,000	21,840	1,135	3,055,000	764	309	2,691
Line B	4,250	57	41	448	281	204	8,875,000	15,720	709	1,878,000	469	190	2,649
Gloucester	4,000	17.4	26	1,575	1,107	941	41,000,000	45,580	3,165	752,000	340	944	429
	3,250	20.8								607,000			
	7,250	18.9								1,359,000			
Provincetown			27	1,980	958	882	38,430,000	25,100	2,893			796	
Thatcher's Island Harbor.	2,360	5.1	24	283	225	141	6,229,000	13,000	506	870,000	218	138	1,719
	3,030	15.4											
	2,155	35.0											
	7,545	17.8											

In addition to the above investigation which have been made in compliance with the specific directions of the Board, I have made an examination of the area included between the Salvages, Flat Ground, and Abner's and Avery's Ledges, in order to determine whether it would be practicable to construct a detached harbor at this locality. In this area eighteen borings were made. They show that the bottom consists of bowlders and solid ledge, and is unsuitable for an anchorage. This project is therefore impracticable. This investigation, although not directly mentioned in the preliminary report of the Board, was made in accordance with its wishes verbally expressed.

4. *Statistics concerning wrecks.*- I have made every endeavor to collect the statistics desired by the Board, but with only partial success. The records of the Board of Trade have been carefully searched, and inquiries have been instituted in every direction, but I have failed to find any accurate and systematic collection of statistics on this subject. The lists of wrecks submitted have been obtained by compilation, principally from the files of the Boston Daily Advertiser. They contain all the wrecks therein noted from 1874 to 1883, inclusive. It has been found impossible to obtain even an approximate estimate of the loss of life and property during this period.

The tables submitted contain the following information:

1. The number of total and partial wrecks in each year, from 1874 to 1883 inclusive.
2. The number of total and partial wrecks in each month for the same period.
3. The number of vessels of each class totally and partially wrecked during the same period.
4. The number of total wrecks opposite certain selected localities extending along the coast from Boston to Portland, these numbers being given for each year and for the total period of ten years.
5. The number of partial wrecks opposite the same localities, and classified in the same manner.
6. The date, locality, character, and name of vessel for each total wreck.
7. The same information for each partial wreck.

8. An additional list of vessels wrecked, the character of the wrecks being unknown, compiled from the Gloucester Telegraph and News.

The chart accompanying these tables shows graphically the number of total and partial wrecks at the various localities.

From Table I it appears that there have been averages per year of 9.8 total, and 37.4 partial wrecks; or a yearly average of wrecks, partial and total, of 47.2.

It appears from Table II that the total number of wrecks is least during the month of July. The number gradually increases from that month until November; diminishes during December; rises to a maximum in January; diminishes again in February; increases again in March, and from that month falls off rapidly to July. The table is graphically represented by the accompanying figure. The data are not sufficiently numerous to establish any relation between the relative numbers of total and partial wrecks and the time of year.

The number and classes of vessels passing Cape Ann is contained in the appended copy of a return to the inspector of the second light-house district, which covers a period extending from July 1, 1880, to July 1, 1882. This return shows only the vessels passing within sight of Thatcher's Island during daylight. From this return it appears that the total number of passing vessels observed during the year ending June 80, 1881, was 37,350; and during the year ending June 30, 1882, 45,422. The number of vessels passing during the night and in thick weather cannot be estimated.

Very respectfully, your obedient servant,

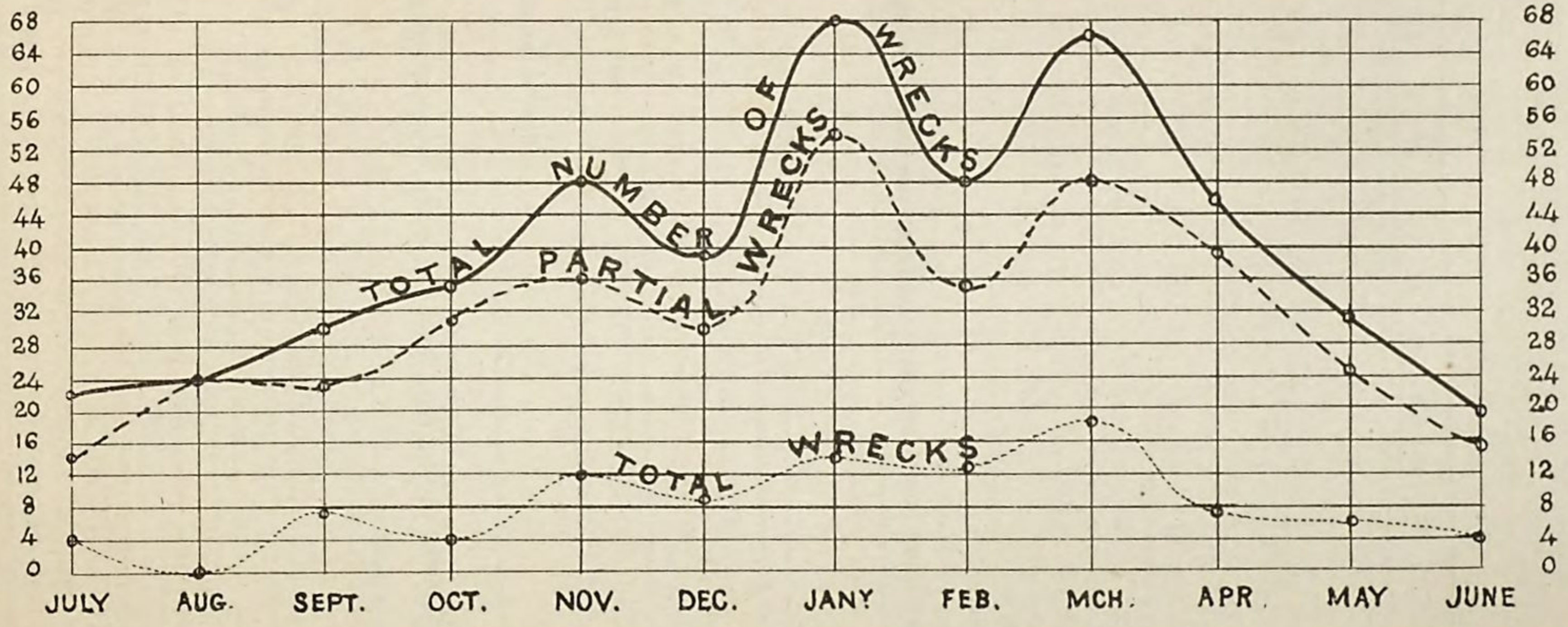
CHAS. W. RAYMOND,
Major of Engineers.

Col. CHARLES E. BLUNT,
Corps of Engineers.

TABLE I.—*Wrecks between Boston and Portland for the years* 1874 *to* 1883 *inclusive, as reported in Boston Advertiser.*

	Total.	Partial.
1874	11	33
1875	11	45
1876	16	41
1877	11	24
1878	12	41
1879	8	37
1880	8	44
1881	7	40
1882	9	38
1883	5	31
Total	98	374

Average yearly total wrecks	9.8
Average yearly partial wrecks	37.4


68
64
60
56
52
48
44
40
36
32
28
24
20
16
12
8
4
0
TOTAL NUMBER OF WRECKS
PARTIAL WRECKS
TOTAL WRECKS
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.
JANY
FEB.
MCH.
APR.
MAY
JUNE

H. EX. 56, 2, 48.

TABLE II.—*Number of wrecks in each month.*

	Total.	Partial.
January	14	54
February	13	35
March	18	48
April	7	39
May	6	25
June	4	15
July	4	14
August	0	24
September	7	23
October	4	31
November	12	36
December	9	30
Total	98	374

TABLE III.—*Number of vessels of each class, total and partial wrecks, during the period of ten years.*

	Total.	Partial.	Aggregate.
Sloops	1	2	3
Schooners	89	330	419
Brigs	2	6	8
Barks	2	7	9
Steamers	3	19	22
Pilot-boats and yachts	.....	7	7
Unknown	1	3	4
Aggregate	98	374	472

TABLE IV.

Locality of total wrecks.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	Total.
Boston (Harding's to Nahant)	1	2	3	0	2	2	1	0	3	2	16
Swampscott	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Salem (Marblehead and Manchester)	.....	.....	1	2	2	.....	.....	2	.....	.....	7
Gloucester	1	1	2	1	.....	.....	1	.....	.....	.....	6
Eastern Point	1	.....	1	.....	.....	.....	1	1	.....	.....	4
Thatcher's Island	.....	1	1	.....	1	.....	.....	1	2	.....	6
Straitsmouth	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
Rockport	1	1	1	.....	1	.....	.....	.....	.....	.....	4
Annisquam	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0
Ipswich	.....	.....	.....	.....	1	.....	.....	1	.....	1	3
Newburyport	1	1	1	5	1	1	.....	1	1	.....	12
Hampton	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Boar's Head	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
Rye	1	.....	.....	.....	.....	2	1	.....	.....	.....	4
Portsmouth	1	2	2	1	1	1	1	.....	1	1	11
Isles of Shoals	.....	1	.....	.....	.....	.....	2	.....	1	.....	4
York and Wells	2	.....	1	.....	.....	.....	.....	.....	1	.....	4
Boon Island	1	1	.....	.....	.....	1	.....	.....	.....	.....	3
Cape Porpoise	1	.....	1	.....	1	.....	1	.....	.....	.....	4
Old Orchard	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1
Cape Elizabeth	.....	1	1	1	.....	1	.....	.....	.....	.....	4
Portland	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1
Total	11	11	16	11	12	8	8	7	9	5	98

TABLE V.

Locality of partial wrecks.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	Total.
Boston (Harding's to Nahant)	5	12	5	.....	8	6	12	8	8	8	72
Swampscott	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Salem (Marblehead and Manchester)	1	.....	2	3	.....	3	.....	1	.....	1	11
Gloucester	3	7	8	1	5	11	7	9	7	7	65
Eastern Point	.....	1	1	1	1	.....	.....	.....	.....	.....	4
Thatcher's Island	.....	2	1	2	.....	.....	1	.....	.....	1	7
Straitsmouth	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Rockport	.....	1	3	1	2	1	4	2	.....	1	15
Annisquam	1	.....	.....	.....	.....	.....	2	.....	.....	.....	3
Ipswich	2	3	1	.....	2	1	2	.....	2	2	15
Newburyport	6	4	4	4	6	3	5	5	.....	5	42
Hampton	.....	.....	.....	.....	1	.....	.....	.....	1	.....	2
Boar's Head	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0
Rye	.....	.....	.....	.....	1	3	1	.....	3	.....	8
Portsmouth	5	6	6	3	9	4	6	13	10	1	63
Isles of Shoals	.....	.....	2	1	.....	.....	1	.....	1	1	6
York and Wells	.....	1	1	.....	.....	1	.....	1	1	1	6
Boon Island	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1
Cape Porpoise	1	1	4	1	.....	1	1	.....	.....	.....	9
Old Orchard	1	1	.....	2	1	.....	.....	.....	1	.....	6
Cape Elizabeth	4	.....	1	3	2	2	1	.....	.....	1	14
Portland	4	6	2	2	1	1	.....	1	4	2	23
Total	33	45	41	24	41	37	44	40	38	31	473

TABLE VI.—*Date and place of total wrecks, and name of vessel.*

Date	Vessel.	Place.
1874.		
Jan. 5	Schooner Eliza S	Gloucester.
14	Schooner Minna	Boston Harbor.
19	Schooner Sassman	Boon Island.
Feb. 16	Schooner Mambrino	Newburyport.
Mar. 25	Schooner Crescent Lodge	Rockport.
May 7	Schooner George	Portsmouth.
July 7	Schooner A. E. Friend	Eastern Point.
Sept. 7	Schooner Mary Bridge	Cape Porpoise.
Nov. 2	Schooner Susan Jane	York.
23	Schooner Lambertine	Rye Beach.
Dec. 3	Schooner E. S. Kingston	York.
1875.		
Feb. —	Schooner Abbie J	Boston.
Mar. 4	Schooner Sea Lion	Rockport.
24	Schooner Birknyre	Isles of Shoals.
Apr. 8	Schooner Jane	Portsmouth.
May 2	Schooner Geo. Brooks	Boston.
13	Schooner Dray	Cape Elizabeth.
Sept. 22	Schooner Brutus	Boon Island.
Oct. 30	Schooner Ocean	Gloucester.
Nov. 10	Schooner Lacon	Newburyport.
17	Schooner S. & B. Small	Kittery.
29	Schooner Speaker	Thatcher's Island.
1876.		
Feb. 15	Schooner Ceres	Gloucester.
15	Schooner Citizen	Do.
16	Schooner Joshua Bates	Cape Elizabeth.
Mar. 21	Schooner Fairy Queen	Portland.
22	Brig M. C. Haskell	Wells.
22	Schooner General Taylor	Portsmouth.
24	Schooner C. E. Jackson	Marblehead.
26	Schooner E. E. Simpson	Cape Porpoise.
26	Schooner A. Porter	Portsmouth.
Apr. 4	Schooner Jenny Lind	Pigeon Cove.
May 10	Schooner Matida	Newburyport.
June 4	Steamer Oriental	Boston.
Nov. 2	Schooner Mazeppa	Eastern Point.
14	Schooner Medford	Londoner.
Dec. 12	Schooner General Mead	Boston.
22	Schooner Emma Bacon	Do.
Jan. 1	Schooner J. D. McCarthy	Newburyport.
2	Schooner May Queen	Marblehead.
12	Schooner General Taylor	Portsmouth.
Feb. —	Schooner L. A. Johnson	Cape Elizabeth.
Mar. 28	.....	Newburyport.
31	Schooner Queen of the Bay	Do.

TABLE VI.—*Date and place of total wrecks, and name of vessel*—Continued.

Date.	Vessel.	Place.
1877.		
Mar. 31	Schooner Flying Fish	Newburyport.
July 1	Schooner Ann Maria	Do.
6	Schooner Ceylon	Gloucester.
Oct. 5	Schooner Friendship	Old Orchard.
8	Schooner William Butler	Marblehead.
1878.		
Jan. 14	Schooner Nile	Boston.
23	Schooner Pilgrim	Portsmouth.
Feb. 1	Bark Zepherine	Boston.
Apr. 12	Schooner Concord	Cape Porpoise.
26	Schooner J. Masohn	Ipswich.
May 9	Schooner Hamden	Hampton.
June 13	Steamer Leopard	Londoner.
Nov. 28	Schooner William Carroll	Newburyport.
28	Schooner C. Cobb	Manchester.
Dec. 2	Schooner Alberta Story	Swampscott.
21	Schooner Rosina	Pigeon Cove.
24	Schooner Aneona	Marblehead.
1879.		
Jan. 2	Schooner J. G. Drew	Boston.
Feb. 20	Schooner Torpedo	Rye.
25	Schooner Rival	Do.
Apr. 18	Schooner L. S. Barnes	Portsmouth.
Sept. 24	Schooner Planet	Boon Island.
Nov. 18	Schooner Greyhound	Newburyport.
20	Schooner S. Waterman	Boston.
Dec. 14	Schooner M. Weston	Cape Elizabeth.
1880.		
Jan. 10	Schooner Parallel	Cape Porpoise.
Feb. 3	Schooner W. J. King	Eastern Point.
4	Schooner ———	Isles of Shoals,
Mar. 27	Schooner Lucy Lee	Boston.
Apr. 3	Schooner J. Meserve	Portsmouth.
Sept. 9	Schooner J. Pierce	Isles of Shoals.
9	Schooner E. F. Tleat	Rye.
Nov. 20	Sloop Bee	Gloucester.
1881.		
Feb. 28	Bark Brothers	Eastern Point.
Mar. 19	Schooner Vanguard	Boar's Head.
April 14	Schooner Active	Manchester.
15	Schooner Esther	Salem.
June 10	Schooner Alice Oakes	Ipswich.
July 13	Schooner Can't Come It	Newburyport.
Dec. 15	Schooner Lucretia Jane	Thatcher's Island.
1882.		
Jan. 1	Schooner Dorado	Do.
3	Schooner Iris	York.
17	Schooner J. K. Baker	Newburyport.
31	Brig Grace Lothrop	Boston.
Feb. 1	Schooner C. H. Lawrence	Do.
Mar. 18	Schooner E. A. Eliot	Portsmouth.
June 13	Schooner Herald	Boston.
Sept. 11	Schooner E. A. Creed	Isles of Shoals.
16	Schooner Milton	Thatcher's Island.
1883.		
Mar. 6	Schooner A. G. Wonson	Boston.
24	Schooner S. A. Gilman	Straitsmouth.
May 21	Steamer City Point	Ipswich
Oct. 21	Schooner William B. Darling	Portsmouth.
Dec. 24	Schooner Essex	Boston.

TABLE VII.—*Date and place of partial wrecks, and name of vessel.*

Date.	Vessel.	Place.
1874.		
Jan. 18	Pilot boat Etta	Boston.
	Pilot boat Phantom	Do.
14	Schooner Eastern Queen	Do.
19	Schooner J. P. Allen	Portsmouth.
19	Schooner Congress	Cape Elizabeth.
25	Sloop Hardscrabble	Gloucester.
	Sloop Screamer	Do.
Feb. 11	Schooner The Star	Portsmouth.
	Tug Tiger	Cape Elizabeth.
23	Schooner W. H. Warren	Portland.

TABLE VII.—*Date and place of partial wrecks, and name of vessel*—Continued.

Date.	Vessel.	Place.
1874.		
Mar. 18	Schooner Arcola	Old Orcharp.
27	Schooner C. Matthews	Squam.
April 7	Schooner F. A. Bailey	Cape Elizabeth.
10	Schooner Charlotte Ann	Ipswich.
12	Schooner Sea Lion	Portland.
18	Schooner Franklin	Cape Elizabeth.
19	Schooner Ed. Lee	Newburyport.
	Schooner A. E. Friend	Do.
	Schooner Julia Franklin	Do.
12	Schooner Alba	Ipswich.
May 1	Schooner Mary Lee Newton	Newburyport.
1	Schooner Fannie A. Bailey	Portland.
June 18	Schooner Arminta	Marblehead.
July 5	Schooner D. S. Lawrence	Boston.
9	Schooner Mercy T. Trundy	Newburyport.
28	Steamer Panther	Do.
Aug. 13	Schooner Gleam	Cape Porpoise.
Sept. 20	Schooner Malanta	Boston.
Nov. 7	Schooner Celia	Portsmouth.
11	Schooner Exchange	Gloucester.
Dec. 14	Schooner Judith Ann	Portsmouth.
18	Schooner Helen Maria	Portland.
28	Schooner Kossuth	Portsmouth.
1875.		
Jan. 5	—— Leocadia	Do.
19	Schooner Ripley Rokes	Do.
24	Schooner A. E. Lane	Rockport.
Feb. 26	Schooner William H. Foye	Gloucester.
March 3	Schooner Julia A. Franklin	Newburyport.
3	Schooner Champion	Gloucester.
5	Schooner Annie Fry	Boston.
5	Schooner Hattie Collins	Do.
5	Schooner Florence	Do.
8	Schooner Alert	Do.
13	Schooner Iodine	Gloucester.
April 14	Schooner S. J. Macy	Boston.
13	Schooner Mary Pickard	Do.
14	Schooner Welaka	Gloucester.
	Schooner Adelia	Boston.
May 6	Schooner Addie Seavey	Newburyport.
17	Schooner ——	Boston.
18	Schooner A. F. Baillie	Portsmouth.
27	Schooner Chieftain	Newburyport.
June 8	Schooner ——	Boston.
5	Schooner Kirka	Ipswich.
5	Schooner Wm. H. Rowe	Do.
12	Schooner E. L. Hammond	Thatcher's Island.
17	Schooner T. J. Becket	Ipswich.
Aug. 2	Schooner Black Warrior	Thatcher's Island.
24	Sloop Daniel Webster	Boston.
Sept. 24	Schooner White Star	York.
Oct. 6	Schooner William Arthur	Eastern Point.
26	Schooner Willis	Portland.
	Schooner Dashaway	Portsmouth.
30	Schooner Henry Clay	Portland.
30	Schooner Ida May	Do.
30	Schooner Elijah	Do.
30	Schooner Eagle	Do.
30	Schooner Amulet	Gloucester.
Nov. 10	Schooner E. A. Cutting	Portsmouth.
10	Schooner Crystal	Boston.
10	Schooner Plover	Do.
10	Brig Machias	Gloucester.
10	Schooner Catawaumteag	Portland.
12	—— Marcellus	Old Orchard.
18	Schooner C. W. Dexter	Cape Porpoise.
19	Schooner Annie Gus	Gloucester.
29	Schooner Lucy May	Newburyport.
Dec. 13	Schooner Hannibal	Portsmouth.
1876.		
Jan. 7	Schooner ——	Boston.
10	Schooner Velocipede	Portsmouth.
19	United States steamer Marion	Do.
21	Schooner Arequipa	Gloucester.
Feb. 1	Schooner Eldorado	Do.
1	Schooner Cherokee	Do.
3	Brig Hattie E. Wheeler	Portland.
23	Schooner Celia	Portsmouth.
March 12	Schooner J. R. Diverty	Gloucester.
21	Barkentine H. S. Jackson	Do.

TABLE VII.—*Date and place of partial wrecks, and name of vessel*—Continued.

Date.	Vessel.	Place.
1876.		
Mar. 21	Schooner ——	Cape Elizabeth.
22	Schooner Kitty Clark	Portsmouth.
22	Schooner Fairfield	Do.
21	Schooner Legal Tender	Gloucester.
21	Schooner Gem of the Ocean	Cape Porpoise.
21	Schooner Revenue	Do.
21	Schooner Hero	Do.
26	Schooner Mary Ann	York.
April 4	Schooner D. & E. Kelly	Rockport.
4	Schooner Sam Lewis	Salem.
4	Schooner Webster	Cape Porpoise.
15	Schooner Native American	Thatcher's Island.
27	Schooner Moses Adams	Gloucester.
30	Schooner Pierce	Salem.
May 7	Schooner Satellite	Annisquam.
13	Bark R. B. Mulhall	Eastern Point.
	Schooner Celia Allen	Isles of Shoals.
11	Bark Osmo	Ipswich.
	Bark H. S. Jackson	Portland.
July 6	Schooner Etta	Rockport.
Aug. 8	Schooner Rough and Ready	Boston.
10	Schooner Hyperion	Newburyport.
18	Schooner Tilton	Boston.
23	Schooner Legal Tender	Newburyport.
26	Schooner Lincoln	Do.
Sept. 17	Schooner Joseph Farwell	Boston.
Oct. 18	Schooner Medford	Do.
31	Schooner Ella Hoghdon	Portsmouth.
Nov. 25	Schooner Adeline	Gloucester.
Dec. 12	Schooner J. D. McCarthy	Newburyport.
21	Schooner J. P. Ames	Isles of Shoals.
1877.		
Jan. 1	Schooner J. W. Dean	Do.
1	Schooner Caressa	Marblehead.
1	Schooner Abbie S. Oakes	Portsmouth.
1	Schooner Little Sadie	Cape Elizabeth.
1	Schooner A. Lewis	Do.
2	Schooner Fairy Queen	Do.
12	Schooner Carrie Nunan	Portland.
Feb. 22	Schooner Creed	Portsmouth.
March 7	Schooner L. B. Ives	Old Orchard.
16	Schooner G. W. Dexter	Thatcher's Island.
16	Schooner Robert Woodruff	Cape Porpoise.
18	Schooner Hussar	Portland.
	Schooner Artist	Thatcher's Island.
Apr. 15	Schooner Ocean Queen	Old Orchard.
June —	Schooner Annie Myrick	Beverly.
July 2	Schooner Sophronia	Newburyport.
Sept. 1	Brig C. J. Adams	Portsmouth.
15	Schooner Sea Queen	Newburyport.
Oct. 2	Schooner Star of the East	Eastern Point.
8	Schooner Chieftain	Newburyport.
22	Schooner Comet	Marblehead.
Dec. 13	Schooner Volant	Gloucester.
14	Schooner Hattie Lewis	Rockport.
21	Schooner Fame	Newburyport.
1878.		
Jan. 10	Brig A. W. Goddard	Cape Elizabeth.
	Schooner Ida May	Portsmouth.
	Schooner Flying Cloud	Do.
	Schooner Paragon	Do.
	Schooner Rover's Bridge	Do.
Mar. 9	Schooner Reporter	Do.
10	Schooner S. C. Pyle	Gloucester.
	Schooner ——	Boston.
4	Schooner Goldsmith's Maid	Gloucester.
Feb. 16	Schooner ——	Boston.
Mar. 20	Schooner Enterprise	Gloucester.
Apr. 27	Steamer Batavia	Boston.
29	Schooner Portland	Hampton.
May 30	Schooner Celia	Portsmouth.
June 8	Schooner Jonathan Cone	Newburyport.
24	Schooner Yacht Vapor	Boston.
July 6	Schooner Oronoco	Straitsmouth.
16	Steamer Minnehaha	Boston.
July 23	Yacht	Newburyport.
Aug. 14	Steamer Forest City	Portland.
Sept. 5	Schooner Hopvine	Ipswich.
11	Steamer Orchis	Boston.
22	Schooner Mary Odell	Old Orchard.

TABLE VII.—*Date and place of partial wrecks, and name of vessel*—Continued.

Date.	Vessel.	Place.
1878.		
Oct. 23	Schooner Horadia	Cape Elizabeth.
Nov. 5	Steamer Panther	Newburyport.
13	Schooner W. D. Cargill	Do.
21	Schooner Addie	Rockport.
22	Schooner Caroline Knight	Rye.
27	Schooner Frank Wilson	Eastern Point.
25	Schooner ——	Ipswich.
28	Schooner Plover	Boston.
29	Schooner William Hill	Rockport.
28	Schooner Koret	Portsmouth.
Dec. 2	Schooner Lillian Estelle	Lynn.
	Schooner J. D. Williams	Portsmouth.
	Schooner Polly	Swampscott.
9	Steamer Hercules	Newburyport.
10	Schooner Una	Do.
21	Schooner Waterloo	Gloucester.
	Schooner E. C. Babcock	Do.
	Schooner E. Hotchkiss	Portsmouth.
1879.		
Jan. 3	Schooner Paul Revere	Boston.
9	Schooner Waterloo	Gloucester.
11	Schooner E. C. Babcock	Do.
16	Schooner C. Knight	Rye.
26	Schooner Bonnie Eloise	Boston.
Feb. 17	Schooner Northern Sea	Portsmouth.
	Schooner Golden Rule	Do.
21	Schooner Susie Prescott	York.
25	Schooner Northern Star	Rye.
	Schooner Fannie Reed	Cape Porpoise.
Mar. 22	Schooner Lucy May	Newburyport.
29	Schooner ——	Do.
31	Brig Katahdin	Boston.
	Schooner Ida L. Ray	Do.
	Schooner Fairdealer	Rye.
Apr. 18	Schooner Helen	Salem.
Aug. 14	Schooner Harper	Boston.
19	Schooner G. P. Trigg	Gloucester.
	Schooner Lizzie	Do.
	Schooner George Clark	Do.
	Schooner Triton	Do.
	Schooner Mary Lizzie	Do.
	Schooner W. H. Warren	Portland.
	Schooner Winnie	Cape Elizabeth.
	Yacht Grant	Do.
	Schooner Eliza Ann	Marblehead.
Sept. 19	Schooner Medford	Portsmouth.
Oct. 17	Schooner Winslow	Salem.
21	Schooner Delia Maria	Portsmouth.
31	Steamer G. A. Chaffee	Gloucester.
Nov. 4	Schooner Addie Emma	Do.
6	Schooner E. F. Norwood	Do.
	Schooner M. E. Daniels	Do.
	Schooner Bay Queen	Rockport.
24	Schooner C. Rankine	Ipswich
Dec. 3	Schooner M. A. Batoon	Newburyport.
24	Schooner Addie Jordan	Boston.
1880.		
Jan. 2	Schooner J. T. Manson	Rockport.
19	Schooner Addie Jordan	Boston.
18	Schooner E L. Rowe	Gloucester.
Feb. 3	Schooner Conductor	Do
12	Schooner A. F. Hames	Thatcher's Island.
16	Schooner J. L. Sturgis	Boon Island.
26	Schooner E. A. Horton	Boston.
Mar. 21	Schooner Paul Revere	Gloucester.
24	Schooner E. V. Nichols	Portsmouth.
28	Schooner ——	Boston.
30	Pilot-boat E. Booth	Do.
27	Schooner Maggie May	Ipswich.
Apr. 3	Schooner W. H. Troy	Gloucester.
12	Schooner ——	Boston.
23	Schooner G. G. Green	Do.
28	Schooner S. E. Babson	Newburyport.
May 10	Schooner Duroe	Rye.
9	Schooner Evergreen	Isles of Shoals.
19	Steamer Persian	Boston.
	Schooner Zingo	Newburyport.
	Schooner Express.	Do.
June 6	Schooner Bob	Ipswich.
9	Schooner Benj. Haskell	Gloucester.
July 12	Bark T. di Saronti	Do.

TABLE VII.—*Date and place of partial wrecks, and name of vessel*—Continued.

Date.	Vessel.	Place.
1880.		
July 19	Schooner Jacob and William	Rockport.
28	Schooner E. L. Conely.	Do.
Aug. 7	Schooner Greyhound	Newburyport.
25	Schooner M. S. Horvet	Portsmouth.
	Schooner W. H. Russell	Do.
Sept. 6	Schooner Mayflower	Cape Porpoise.
8	Schooner Francis Ellen	Rockport.
	Schooner Mary A	Portsmouth.
	Schooner ——	Newburyport
9	Schooner Mary W	Squam.
Oct. 8	Steamer Bassam	Boston.
24	Schooner Vanguard	Portsmouth.
27	Schooner Gov. Cony	Boston.
Nov. 8	Schooner Georgie	Cape Elizabeth.
16	Bark Formosa	Squam.
22	Schooner Clyde	Gloucester.
Dec. 1	Schooner E. C. Gates	Boston.
	Schooner Pavilion	Do.
10	Schooner ——	Do.
27	Schooner Tilly E	Portsmouth.
1881.		
Jan. 9	Brig Happy Return	Boston.
22	Schooner ——	Do.
23	Schooner Fannie Givan	Gloucester.
28	Schooner C. B. Manning	Do.
	Bark M. B. Tower	Do.
	Schooner May Day	Do.
29	Schooner Laughing Water	Rockport.
Feb. 1	Schooner Vanguard	Portsmouth.
12	Schooner E. E. Howes	Boston.
18	Schooner Grace Choate	Portsmouth.
21	Schooner Golden Eagle	Do.
	Schooner Minetta	Do.
19	Schooner H. N. Clark	Newburyport.
31	Schooner Nellie Chase	York.
Apr. 1	Schooner Eva May	Portsmouth.
16	Schooner Dexter	Boston.
	Pilot-boat No. 2	Do.
15	Schooner Barraconta	Gloucester.
	Schooner Gatherer	Do.
	Schooner Lucy D	Portsmouth.
16	Steamer Williamsport	Do.
	Schooner M. S. Hontvet	Do.
15	Schooner E. L. Higgins	Do.
May 8	Schooner Z. L. Wallingford	Newburyport.
11	Schooner Admiral	Gloucester.
12	Schooner A. B. Jacobs	Newburyport.
	Schooner Charleston	Do.
	Schooner M. A. Wilson	Do.
June 10	Schooner Mary Jane	Portsmouth.
27	Schooner Mary Eliza	Do.
30	Schooner Aurora Borealis	Salem.
Aug. 18	Schooner Northern Eagle	Boston.
Sept. 17	Schooner Joseph M. Lane	Rockport.
	Schooner Admiral	Gloucester.
24	Schooner Velocipede	Portsmouth.
Nov. 3	Bark Gibralter	Gloucester.
5	Schooner L. A. Blossom	Boston.
Dec. 7	Schooner O. A. Dow	Portsmouth.
23	Schooner M. A. Barstow	Boston.
28	Schooner Luella	Portland.
1882.		
Jan. 4	Schooner Alabama	Rye.
7	Schooner Samuel Hart	Boston.
11	Schooner C. S. Tappan	Rye.
19	Schooner Marysville	Portsmouth.
22	Schooner Jefferson Borden	Boston.
27	Schooner William H. Jourdan	Portland.
31	Schooner Walter Sprite	Portsmouth.
	Schooner Nettie Walker	Boston.
Feb. 2	Schooner Bucephalus	Do.
4	Schooner Bunker Hill	Gloucester.
	Schooner Flying Scud	Ipswich.
8	Schooner Amon	Gloucester.
11	Schooner D. C. Baker	Portsmouth.
21	Schooner Sarah	York.
22	Schooner Henry Ellsworth	Gloucester.
	Schooner Joseph Otis	Do.
Mar. 2	Schooner Lizzie K	Portland.
	Schooner Northern Star	Portsmouth.
17	Steamer Vidette	Boston.

TABLE VII.—*Date and place of partial wrecks, and name of vessel*—Continued.

Date.	Vessel.	Place.
1882.		
Mar. 27	Steamer Rochester	Boston.
Apr. 4	Schooner L. T. Chester	Portsmouth.
7	Schooner A. Brabrook	Boston.
May 20	Schooner Maggie Smith	Portsmouth.
June 6	Schooner Catalina	Gloucester.
Sept. 5	Schooner J. P. Ames	Portsmouth.
12	Schooner Pulaski	Rye.
15	Schooner ——	Portsmouth.
24	Schooner F. Foster	Hampton.
Oct. 9	Schooner Caroline New	Portsmouth.
5	Bark Glendower	Isles of Shoals.
21	Schooner Fred. Gray	Ipswich.
27	Schooner Commander	Gloucester.
Nov. 15	Schooner R. F. Hart	Portland.
29	Schooner Virginia	Old Orchard.
Dec. 11	Schooner J. A. Pillsbury	Boston.
8	Schooner Sarah Louise	Gloucester.
	Schooner Jonathan Cone	Portsmouth.
13	Schooner F. W. Talbot	Portland.
1883.		
Jan. 4	Schooner James Parker	Gloucester.
	Schooner Carthage	Do.
	Schooner Admiral	Do.
10	Schooner Samos	Boston.
15	Schooner Nathan Lawrence	Gloucester.
Feb. 6	Schooner C. F. Friend	Boston.
	Schooner David Toney	Do.
9	Schooner Solomon Poole	Portland.
10	Schooner Rising Star	Ipswich.
Mar. 6	Schooner Northern Star	Thatcher's Island.
20	Schooner E. M. Johnson	Newburyport.
Apr. 9	Steamer Brooklyn	Portland.
	Schooner Romeo	Rockport.
May 24	Steamer City of Havernill	Newburyport.
28	Schooner Atlanta	Gloucester.
July 6	Schooner Ida L. Ray	Newburyport.
16	Schooner David Toney	Cape Elizabeth.
21	Barque Vigilant	Ipswich
Aug. 4	Schooner Oliver Eldridge	Newburyport.
Sept. 14	Steamer Victoria	Boston.
28	Schooner H. J. Cottrell	Newburyport.
Oct. 3	Schooner J. Whitehouse	Portsmouth.
3	Schooner Young Chief	York.
8	Steamer Batavia	Boston.
22	Schooner G. W. Rawley	Lynn.
27	Schooner I Am Here	Isles of Shoals.
Nov. 13	Schooner E. H. Power	Marblehead.
21	Schooner Bess	Gloucester.
Dec. 3	Schooner Isaac Chapman	Do.
21	Schooner Augusta Smith	Boston.
21	Schooner Dolphin	Do.

TABLE VIII.—*Additional list of vessels wrecked, as compiled from the Gloucester Telegraph and News.*

Date.	Vessel.	Place.
Sept., 1874	Schooner Coral	Rockport.
Mar. 4, 1875	Schooner Sea Lion	Do.
Nov. 22, 1875	Schooner Wm. Hill	Pigeon Cove.
Oct. 9, 1877	Schooner High Flyer	Gloucester.
Nov. 7, 1877	Schooner Avon	Do.
Jan. 4, 1878	Schooner Julia Newhall	Do.
June 18, 1878	Schooner Sea Bird	Thatcher's Island.
Sept. 4, 1878	Schooner Ripple	Gloucester.
Dec. 28, 1878	Schooner Levanter	Do.
May 7, 1879	Schooner Admiral	Do.
Aug. 17, 1879	Schooner E Pluribus Unum	Annisquam.
Feb. 3, 1880	Schooner Abbie Bursley	Do.
Mar. 13, 1880	Schooner Northern Star	Thatcher's Island.
Apr. 7, 1881	Steamer S. B. Jones	Gloucester.
June 8, 1881	Schooner Dauntless	Rockport.
Sept. 16, 1881	Schooner Admiral	Gloucester.
Feb. 22, 1882	Schooner Cora	Do.
Sept. 15, 1882	Schooner W. P. Ritchie	Rockport.
Mar. 21, 1883	Schooner C. P. Thompson	Gloucester.
25, 1883	Schooner Sam'l Gilman	Straitsmouth.
June 26, 1883	Schooner Claribel	Avery's Rock.
Sept. 24, 1883	—— Isaac A. Chapman	Good Harbor.

Copy of return to United States light-house inspector, of number of vessels passing Cape Ann lights.

Three months ending—	Ships.	Barks.	Brigs.	Schoon-ers.	Sloops.	Steamers.
September 30, 1880	24	103	281	11, 155	728	877
December 31, 1880	12	54	186	5, 817	407	604
March 31, 1881	13	65	164	3, 581	234	457
June 30, 1881	32	119	299	10, 999	620	519
Total for the year	81	341	930	31, 552	1, 989	2, 457
September 30, 1881	13	68	140	12, 826	1, 050	815
December 31, 1881	5	28	53	12, 265	521	577
March 31, 1882	0	28	38	6, 732	189	385
June 30, 1882	1	25	37	8, 773	444	409
Total for year	19	149	268	40, 596	2, 204	2, 186

Grand total from September 30, 1880, to June 30, 1881, 37,350 vessels.
Grand total from September 30, 1881, to June 30, 1882, 45,422 vessels.
Per cent. of gain in one year, 21. 8.
At same rate of gain, in year ending June 30, 1883, 55,325 vessels would have passed.

CAPE ANN

LOBLOLLY COVE

EMERSON'S POINT

ATLANTIC OCEAN

THATCHERS I.

MILK I.

OAKS ROCK

NORTH L.

SOUTH L.

True Meridian

DONER

LOW

Note. The soundings are expressed in feet and tenths and refer to mean low water, which is 10.25 feet below B.M. at the entrance to Rockport western harbor. It is a hole cut in the wall of the north pier, 4 ft. 8 in. from the coping and 37 feet from the end of the pier.

Circles mark the places where borings have been made to examine the bottom.

High water lines and dotted contours are taken from U.S. C.S. manuscript map.

Area shaded thus ▨ represents base of proposed breakwaters, top being 15 feet wide in grade 17 with slopes of 1 on 2 seaward and 1 on 1 towards the harbor.

MAP OF HYDROGRAPHIC SURVEY

OF THE LOCALITY BETWEEN

CAPE ANN

AND

THATCHERS AND MILK ISLANDS,

FOR A HARBOR OF REFUGE.

Surveyed by direction of Major CHAS. W. RAYMOND, Corps of Engineers, U.S.A.

By Sophus Haagensen, Assistant Engineer.

October 1884

Scale.

100 50 0 100 200 300 400 500 1000 1500 2000 Feet.

Portland, Me. December 11th 1884.
Respectfully transmitted to the Engineer Department.
Chas. E. Blunt
Colonel of Engineers,
and Senior Member of Board of Engineers convened
by S.O. 8th M. H.Q. C. of E. July 24th 1884.

U.S. Engineer Office, Boston, Mass., November 19, 1884.
Respectfully transmitted to the Board of Engineers with letter of this date.
Chas. W. Raymond
Major of Engineers

H. FX. 2 6., 2. 48.

GLOUCESTER HARBOR

MASSACHUSETTS

From a Trigonometrical Survey

under the direction of A.D. BACHE Superintendent of the

SURVEY OF THE COAST OF THE UNITED STATES

Triangulation by C.O. BOUTELLE Assistant U.S.C.S.

Topography by H.L. WHITING Assistant

Hydrography by the party

under the command of Lieut. H.S. STELLWAGEN U.S.N. Asst.

Scale $\frac{1}{20,000}$

1855

Aids to Navigation corrected to 1884

Issued October 1877 C.P. PATTERSON Superintendent.
Verified, J.E. HILGARD Assistant in charge of Office.

PRICE 20 CENTS

SAILING DIRECTIONS

Approaching Gloucester from Cape Ann, beware of the Londoner, a rock, 200 yds. in extent, ½ a mile S.E. by E. from Thatcher's Id. South Lt. There is a channel to the Wd. ½ of a mile wide with 5 & 6 fms. but strangers should pass to the Ed. not approaching the Lts. nearer than one mile, till they bear N.W. With Thatcher's Id. Lts. in range bearing N. by E.¾ E. (N. 84° E.) one mile distant, steer S.W. by W.¼ W. (S. 50° W.) five miles till East Pt. Lt. bears nearly North, haul round the Pt. to the Nd. & Wd. keeping ½ a mile from shore to clear East Pt. Ledge and Dog Bar.

To enter S.E. Harbor. *Bring Ten Pound Island Lt. to bear N.E. by N. ¼ N. (N. 14° E.) and run for it, when within ¼ a mile, or halfway between it and Black Bess Pt. steer E. by N. ¼ N. (N. 61° E.) towards Long Beach to Anchorage in 5 & 6 fms. muddy bottom.*

To enter Inner Harbor. *Bring Ten Pound Id. Lt. to bear N.E. and steer N.E. ¼ N. (N. 28° E.) passing on Port hand of Round Rock Shoal and Ten Pound Id. Ledge, when Ten Pound Id. Lt. bears E.S.E. (S. 79° E.) distant 300 yds. steer N.E. by E. ½ E. (N. 53° E.) into Inner Harbor.*

Note. *The Courses and Bearings without the brackets are Magnetic, those within are True. The distances are in Nautical miles. The Soundings are expressed in feet to 18 feet or within the dotted surfaces, beyond them in fathoms, and show the depth at mean low water – the plane of reference. The dotted surfaces beyond low water mark represent the bottom within the respective depths of 6, 12, and 18 feet. The characteristic soundings only, are given on the chart, they are selected from the numerous soundings taken in the survey so as to represent the figure of the bottom.*

TIDES

Corrected Establishment	XI^h IV^m
Mean Rise and Fall of Tides	8.9 ft.
Mean do. do. of Spring Tides	10.7 "
Mean do. do. of Neap Tides	7.0 "
Mean Duration of Rise \ Reckoning from the middle of one	6^h 22^m
Mean do. of Fall \ Stand to the middle of the next	5^h 58^m
Mean do. of Stand	0^h 15^m

Abbreviations used in the bottoms of this chart

Materials in Capitals	Colors or shades two small letters	Other qualities three small letters
S. for Sand	bk. for black	hrd. for hard
M. " Mud	bu. " blue	sft. " soft
G. " Gravel	lt. " light	brk. " broken
R. " Rocks	gy. " grey	fne. " fine
Sh. " Shells		crs. " coarse

BUOYS

Red Buoy to be left in entering on Starboard hand.
Black " " " " " Port "

Light Houses

Name and Locality	Latitude	Longitude West from Greenwich Observatory In arc	In time	Character	Height above Level of Sea	Distance visible in Naut. Miles
Ten Pound Island Light	42° 36′ 05″	70° 39′ 56″	4^h 42^m 39^s.7	*Fixed White*	50 Ft.	11
Eastern Point Light. (Fog Bell)	42° 34′ 47″	70° 39′ 53″	4^h 42^m 39^s.5	*Flashing Red, interval 5 sec.*	60 "	13. 2

The Triangulation was executed in 1849
The Topography do. do. in 1851
The Hydrography do. do. in 1853
Magnetic Observations by Professor G.W. Keely in August 1849 & C.A. Schott Asst. in July 1859
Variation of the Magnetic Needle in 1882 12° 30′ W.
Present annual increase 2′.8

Statute Miles 1 0 1

Nautical Miles 1 0 1

Round Rock Shoal *has 13 ft. water on it, is in line with and midway between East Point and Muscle Pt. with a cross range of East church Gloucester just open to Port of Ten Pound Id. Lt.*

Ten Pound I. Ledge *is ½ of a mile to the Sd. and Wd. of Ten Pound Id. with 9 ft. water on it; the Lt. bearing N.E.¾ E. (N. 42° E.) Both dangers may be approached within 50 yds. in all directions.*

Field Rocks *above water at low tide are ¼ mile West of Ten Pound Id. and ½ mile from Western shore.*

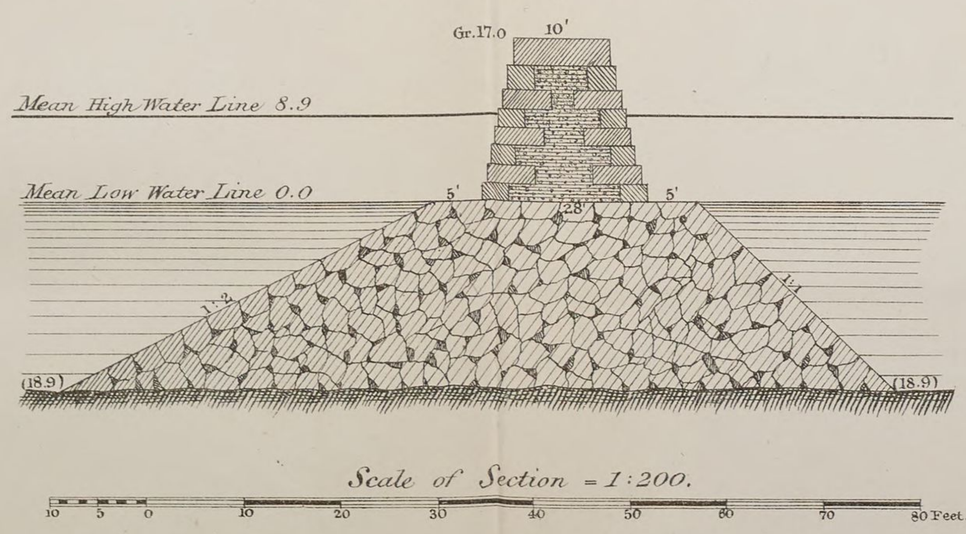
Babson's Ledge *near Fort Pt. is 200 yds. S. of Fort at entrance of Inner Harbor with 10 ft. water.*

Pinnacle Rock *lately discovered was determined for the first time in Oct. 1853 by Lieut. Comdg. Stellwagen. It rises to a point with 9 ft. water on it at ordinary tide, and deep water around 10 ft. from centre. It lies 80 yds. S.W. of Spindle Rock off the large wharf.*

Harbor Rock *and others are marked by iron beacons. The channel between Ten Pound I. Ledge and Eastern shore is too much obstructed by rocks to be available. The dangers to be avoided at entrance of Harbor are Norman's Woe Ledge, East Pt. Ledge, and Dog Bar from ½ to ¾ of a mile from East Point. The coast from Thatchers Id. to Baker's Id. may be approached to within a mile in 15 and 20 fms. water.*

Portland, Me. December 11th 1884.
Respectfully transmitted to the Engineer Department.
(Signed) C. E. Blunt
Colonel of Engineers
and Senior Member of Board of Engineers convened by S.O. No. 91, H.Q.C. of E. July 26th 1884.

Average Cross Section of Breakwater.



Scale of Section = 1:200.

10 5 0 10 20 30 40 50 60 70 80 Feet.

STUDY FOR A HARBOR OF REFUGE

November 1884.

U.S. Engineer Office, Boston Mass., November 19, 1884.
Respectfully transmitted to the Board of Engineers with letter of this date.
(Signed) Chas. W. Raymond
Major of Engineers.

H. EX. 56, 2, 48.

Portland, Me. December 11th 1884.
Respectfully transmitted to the Engineer Department.

Chs. E. Blunt.
Colonel of Engineers
and Senior Member of Board of Engineers convened
by S.O.N° 91, H.Q. C of E., July 26th 1884.

STUDY FOR A HARBOR OF REFUGE

INTERIOR LINES IN SANDY BAY

SCALE
1000 500 0 500 1000 1500 2000 Feet

EXPLANATION OF CONTOURS.

High Water Line	
Low " "	
6 ft. Contour Line	
12 " " "	
18 " " "	
24 " " "	
30 " " "	
36 " " "	
42 " " "	
48 " " "	
54 " " "	
60 " " "	
66 " " "	
72 " " "	
78 " " "	
84 " " "	

PIGEON COVE HARBOR
PIGEON HILL GRANITE CO.
ROCKPORT GRANITE CO.
KNOWLTON'S
HADDOCK HOLE
SANDY BAY
LINE A
LINE B
MITCHELL'S R.
SPINDLE
DODGE'S
OUTER R.
ROCKPORT HARBOR
TOWN OF ROCKPORT
GULL POINT
GAP HEAD
STRAITSMOUTH ISLAND
STRAITSMOUTH I. LT.
TRUE MERIDIAN

U.S. Engineer Office, Boston, Mass., November 19 1884
Respectfully transmitted to the Board of Engineers
with letter of this date

Chas. W. Raymond
Major of Engineers.

H. EX. 56, 2, 48.

PORTLAND

1
23

CAPE ELIZABETH

4 14

OLD ORCHARD

1 6

RICHMOND I.

MAINE

SACO

GOAT I.

CAPE PORPOISE

4 9

OCEAN

YORK R.

4 6

3 1

BOON I.

PORTSMOUTH

11 63

NEW HAMPSHIRE

RYE

4 8

4 6

ISLE OF SHOALS

ATLANTIC

1

HAMPTON

1 2

+ Centre of Partial Wrecks

NEWBURYPORT

12 42

+ Centre of Total Wrecks

MASSACHUSETTS

3 15

IPSWICH

3

SQUAM

4 15

ROCKPORT

CAPE ANN

** SALVAGES

Straitsmouth Lt.

1 1

THATCHERS I.

6 7

GLOUCESTER

6 65

4 4

EASTERN PT.

MANCHESTER

7 11

SALEM

MARBLEHEAD

SWAMPSCOTT

LYNN

1 1

BOSTON

16 72

Meridian

True

MAP OF COAST BETWEEN
BOSTON AND PORTLAND
SHOWING LOCALITIES AND NUMBER OF WRECKS
FROM 1874 TO 1883 INCLUSIVE.

SCALE

5 4 3 2 1 0 5 10 15 STAT. MILES

NOTE

Figures in squares indicate number of total wrecks
" " circles " " " partial "

Portland, Me. December 11th 1884
Respectfully transmitted to the Engineer Department

Chas E Blunt

Colonel of Engineers,
and Senior Member of Board of Engineers convened
by S.O. N° 91, H.Q. C. of E. July 26th 1884.

U.S. Engineer Office, Boston, Mass., November 19, 1884
Respectfully transmitted to the Board of Engineers
with letter of this date

Chas W. Raymond

Major of Engineers

H. EX. 56, 2, 48.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 57.

POST-OFFICE AT POUGHKEEPSIE, N. Y.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

An estimate from the Supervising Architect for an appropriation of $30,000 *for the completion of the post-office at Poughkeepsie, N. Y.*

JANUARY 5, 1885.—Referred to the Committee on Appropriations and ordered to be printed.

TREASURY DEPARTMENT,
January 2, 1885.

SIR: I have the honor to transmit herewith a communication of date the 30th ultimo, from the Supervising Architect, regarding the necessity for an additional appropriation of thirty thousand dollars ($30,000) for extending the second story of the post-office at Poughkeepsie, N. Y., and for the completion of the building.

In my judgment the appropriation should be made during the present session of Congress.

Very respectfully,

H. McCULLOCH,
Secretary.

Hon. JOHN G. CARLISLE,
Speaker of the House of Representatives.

TREASURY DEPARTMET,
OFFICE OF THE SUPERVISING ARCHITECT,
December 30, 1884.

SIR: I have the honor to call your attention to the necessity of extending the second story of the court-house, &c., at Poughkeepsie, N. Y., in order that a building harmonious in appearance may be constructed and sufficient accommodation afforded for the proper transaction of the public business. The limit fixed by Congress as the cost of this building was so small as to necessitate the omission of the greater portion of the second story and the use of inferior and cheaper material for the interior finish. If a sufficient appropriation is made at the pres-

ent session of Congress for the extension of the building the work can be done to greater advantage and more economically than if the present contracts are permitted to be completed before arrangements are made for the extension.

An additional appropriation of $30,000 will be required to complete the building as originally designed, the full height, including hard-wood finish for the interior throughout; and I have the honor to request that the matter may be called to the attention of the chairmen of the Committees on Appropriations in the House of Representatives and Senate.

Very respectfully,

M. E. BELL,
Supervising Architect.

Hon. HUGH MCCULLOCH,
Secretary of the Treasury.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 58.

LIGHT AT NORTHWEST PASSAGE, KEY WEST, FLA.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

A communication from the Light-House Board, recommending the establishment of a small range-light at Northwest Passage, Key West, Fla., and asking an appropriation of $200 *therefor.*

JANUARY 5, 1885.—Referred to the Committee on Appropriations and ordered to be printed.

TREASURY DEPARTMENT,
December 20, 1884.

SIR: I have the honor to transmit herewith a copy of a letter of the Light-House Board, dated the 18th instant, stating that after careful investigation the Board has decided that the interests of navigation require the establishment of a small range-light at Northwest Passage, Key West, Fla., and asking that Congress be requested to appropriate the sum of $200 for the purpose, and that in the classification of the Board's estimates for special appropriations it be inserted in the list headed "Necessary."

I have accordingly respectfully to transmit this communication, so that action may be taken by Congress in the matter, if it appears wise to do so, agreeably to the desire of the Light-House Board.

Very respectfully,

H. McCULLOCH,
Secretary.

Hon. J. G. CARLISLE,
Speaker of the House of Representatives.

TREASURY DEPARTMENT,
OFFICE OF THE LIGHT-HOUSE BOARD,
Washington, December 18, 1884.

SIR: The Light-House Board has the honor to state that, after careful consideration, it has decided that the interests of navigation require

that a small range-light should be established at Northwest Passage, Key West, Fla.

The vessels comprising three lines of steamers and a large number of sailing vessels pass through this channel, and the mail steamer, which usually comes in at night, has been paying a pilot $5 a night to place a lantern on the bar buoy.

Request is therefore respectfully made that Congress be asked to appropriate, for the establishment of a range-light at Northwest Passage, Key West, Fla., the sum of $200, and that in the classification of the Board's estimate for special appropriation it be inserted in the list headed "Necessary."

Very respectfully,

D. P. HEAP,
Major of Engineers, United States Army, Engineer Secretary.

The Hon. SECRETARY OF THE TREASURY.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. Doc. No. 59.

CASE OF HALLET KILBOURN VS. JOHN G. THOMPSON.

LETTER

FROM

THE ATTORNEY-GENERAL,

INCLOSING

Accounts of stenographers for reporting the case of Hallet Kilbourn vs. John G. Thompson, and asking an appropriation for the payment thereof.

JANUARY 5, 1885.—Referred to the Committee on Appropriations and ordered to be printed.

DEPARTMENT OF JUSTICE,
Washington, December 23, 1884.

SIR: Herewith inclosed is an account of $254, presented by Messrs. Clephane & Boswell, stenographers, of this city, for services in reporting the third trial of Hallet Kilbourn against John G. Thompson, late Sergeant-at-Arms of the House of Representatives.

Accompanying the account are copies of six papers, explanatory of their claim.

Also inclosed is the stenographic account of E. D. Easton in the same case, amounting to $36.25. The account is supported by a certificate of the district attorney and his assistant.

There being no appropriation under my control out of which these services can be paid, and in compliance with the request of the stenographers, the same is transmitted to Congress for appropriate action.

Very respectfully,

BENJAMIN HARRIS BREWSTER,
Attorney-General.

Hon. JOHN G. CARLISLE,
Speaker of the House of Representatives.

WASHINGTON, D. C., *December* 19, 1884.

SIR: We beg to hand you herewith the following papers relative to our claim against the Government for services rendered as stenographers in reporting the Kilbourn-Thompson trials:

Bill of J. O. Clephane, 1883: 1,016 folios, at 25 cents per folio, $254, with accompanying certificate of George B. Corkhill, the then district attorney, and Randolph Coyle, his assistant.

Letter of the Attorney-General to Mr. Clephane, dated February 21, 1884, refusing payment of above account for reasons therein stated.

Letter of District Attorney Worthington, dated March 6, 1884, and addressed to the Attorney-General, requesting permission to employ a stenographer.

Letter of the Attorney-General (March 13, 1884), stating that the expenses for reporting the Kilbourn-Thompson case could not be paid out of appropriation for miscellaneous expenses of courts.

Letter of District-Attorney Worthington (June 20, 1884), certifying to the correctness of the account of Messrs. Clephane & Boswell.

Letter of Clephane & Boswell (June 27, 1884), to Senator Allison, chairman of the Committee on Appropriations, asking payment of their account.

We would respectfully request that these papers be forwarded to the proper officer of the House of Representatives so that they may be laid before the Appropriations Committee of that body.

We are, sir, with great respect, your obedient servants,

CLEPHANE & BOSWELL.

The Hon. the ATTORNEY-GENERAL,
Washington, D. C.

The United States to James O. Clephane, stenographer, Dr.

October 29, October 30, October 31, November 1, November 2, 1883. For reporting and transcribing testimony in the supreme court, District Columbia, in the case of Hallet Kilbourn *v.* John G. Thompson, ex-Sergeant-at-Arms, House of Representatives, for the use of the United States district attorney: 1,016 folios, at 25 cents (two copies) $254 00

I solemnly swear that the above account is correct and just; that the services have been performed, and have not been paid for in whole or in part; that the number of folios charged is arrived at by estimate based on the eount of a number of pages, and does not exceed the number actually transcribed, and that the prices charged are just and reasonable.

JAS. O. CLEPHANE.

Sworn to before me this 13th day of December, 1883.
[SEAL.]

RANDOLPH COYLE,
United States Commissioner, District of Columbia.

HALLET KILBOURN, PLAINTIFF,
vs.
JOHN G. THOMPSON, DEFENDANT. } At law, No. 16,288.

We hereby certify that the defense of the above case, which case arose out of the arrest of the plaintiff by the defendant while Sergeant-at-Arms of the House of Representatives, was conducted by us under the supervision and direction of the Attorney-General, as provided by section 8 of the act of March 3, 1875 (18 Stats., 401); that the case was one involving very important principles of law as well as the contingent liability of the Government for a large sum of money; that it was absolutely necessary to the proper trial of the cause as well as to provide for the probable contingency of a hearing on appeal that a full stenographic report of all the testimony in the case should be made and preserved. We accordingly engaged the services of Mr. James O. Clephane to report the evidence, and he was actually in attendance, either in person or by a competent substitute, during the seven days occupied by the trial, and made a full stenographic report of the evidence, of which two type-writer copies were furnished to us of each days' proceedings during the trial.

We further certify that in our opinion Mr. Clephane's account of $254 for this service is reasonable and just.

GEORGE B. CORKHILL,
U. S. District Attorney, D. C.
RANDOLPH COYLE,
Asst. U. S. Attorney, D. C.

DEPARTMENT OF JUSTICE,
Washington, D. C., February 21, 1884.

SIR: Your account, amounting to $254, for services in reporting the case of Kilbourn *v.* Thompson has been received, and payment for the same is declined upon the ground that this is not an expense which properly falls within the appropriations for defraying the expenses of United States courts.

Very respectfully,

BREWSTER,
Attorney-General.

JAMES O. CLEPHANE, Esq.,
Stenographer, Washington, D. C.

UNITED STATES DISTRICT ATTORNEY'S OFFICE,
Washington, D. C., March 6, 1884.

SIR: The case of Hallet Kilbourn against John G. Thompson, for damages for alleged false imprisonment, is set for trial on Monday the 17th instant. This is the case in which the defendant, while Sergeant-at-Arms of the House of Representatives, arrested the plaintiff under an order of the House, and kept him in jail for over a month. At the first trial of the case the jury gave a verdict for the plaintiff for $100,000, which the court set aside. At a second trial the plaintiff obtained a verdict for $60,000, which the court also set aside.

I think it a case in which the proceedings should be reported by a stenographer for the use of the Government, and I therefore have the honor to ask that I may be authorized to employ a stenographer for that purpose.

Very respectfully,

A. S. WORTHINGTON,
Attorney of the United States for the District of Columbia.

Hon. BENJAMIN HARRIS BREWSTER,
Attorney-General.

DEPARTMENT OF JUSTICE,
Washington, D. C., March 13, 1884.

SIR: I have your letter of the 6th instant, in which you request authority to employ a stenographer to report the proceedings in the case of Hallet Kilbourn *vs.* John G. Thompson, which is set for trial on the 17th instant.

This expense is not one that can properly be paid from the appropriation for miscellaneous expenses of courts, and there are no other funds under my control available for their payment.

As the act of Congress, March 3, 1875, placed the defense of such action under the supervision and direction of the Attorney-General, the expense of a strenographer is authorized with the understanding that the payment therefor must be provided for by Congress, specifically.

Very respectfully,

BREWSTER,
Attorney-General.

A. S. WORTHINGTON, Esq.,
United States Attorney, Washington, D. C.

UNITED STATES DISTRICT ATTORNEY'S OFFICE,
Washington, D. C., June 20, 1884.

SIRS: In reply to your request of the 23d ultimo, addressed to my assistant, Mr. Coyle, for a statement as to the services rendered by you in reporting the third trial of Hallet Kilbourn against Thompson, late Sergeant-at-Arms of the House of Representatives, I have to say that, by actual count, it appears that your report of the testimony in the case comprises 559 folios, which, at 25 cents per folio, amount to $139.75.

I inclose herewith, in accordance with your verbal request, a copy of my letter to the Attorney-General, under date March 6, 1884; also a copy of the reply of the Attorney-General, dated March 13, 1884, authorizing the employment of a stenographer in the case in question, "with the understanding that the payment must be provided for by Congress, specifically."

Very respectfully,

A. S. WORTHINGTON,
Attorney of the United States for the District of Columbia.

Messrs. CLEPHANE & BOSWELL,
Stenographers.

WASHINGTON, D. C., *June* 27, 1884.

SIR: In compliance with your suggestion, we hand you herewith our accounts against the Department of Justice for reporting the last two trials of the Kilbourn-Thompson case in the United States court of this District.

As you will see by the inclosed letters from the Attorney-General and the district attorney, the reporting of that case was deemed by them to be of great importance. When requested by the proper officers to do this work we had no doubt it would be paid for. We refer now especially to the last trial of the case but one.

When we presented our bill at the Department we were informed there was no appropriation out of which it could be paid, but were given an assurance that Congress would provide for it by making a special appropriation, or authorize its payment out f the appropriation made for miscellaneous expenses of courts.

Just before the case came on for hearing the last time we were asked by the present district attorney to undertake the reporting of it, and he stated that he had no doubt provision would be made by Congress for the payment of both bills in either one or other of the modes suggested above. He appeared to be very anxious to have us do the work, and we consented to do it.

Of course the reporting of these two trials necessitated an outlay by us in addition to the rendition of our own personal services.

Very respectfully, your obedient servants,

CLEPHANE, BOSWELL & CO.

Hon. WILLIAM B. ALLISON,
Chairman Committee on Appropriations, United States Senate.

The United States to E. D. Easton, Dr.

1883.

To reporting proceedings in case of Kilbourn *vs.* Thompson, in supreme court of District of Columbia, on motion to set aside verdict, two days, November 10 and 12, at $10 per day	$20 00
To reporting and transcribing opinion of Cox, J., setting aside verdict, November 17, 1883, 65 folios, at 25 cents	16 25
Total	36 25

I solemnly swear that the above account is correct and just; that the services have been performed, and have not been paid for in whole or in part; that the number of folios charged is arrived at by estimate based on the count of a number of pages, and does not exceed the number actually transcribed, and that the prices charged are just and reasonable.

E. D. EASTON,
Stenographer.

Sworn to before me this 12th day of December, 1883.

A. JOHNS,
United States Commissioner.

HALLET KILBOURN, PLAINTIFF,
vs.
JOHN G. THOMPSON, DEFENDANT.
} At law, No. 16,288. Supreme court, D. C.

We hereby certify that the defense of the above case, which case arose out of the arrest of the plaintiff by the defendant while Sergeant-at-Arms of the House of Representatives, was conducted under the supervision and direction of the Attorney-General, as provided by section 8 of the act of March 3, 1875 (18 Stats., 401); that the case was one involving very important principles as well as the contingent liability of the Government for a large amount of money; that the verdict of the jury having been for $60,000 damages in favor of the plaintiff, and a motion to set aside the verdict having been made by us, it became absolutely necessary to have full stenographic notes of the argument of counsel in support of and in opposition to this motion, and a full report of the opinion of the court upon the motion.

Accordingly, on the day the argument of the motion began, as we had inadvertently omitted to notify Mr. Clephane, who had reported the testimony, and as he was not in court, we sent for the nearest stenographer, who proved to be Mr. E. D. Easton, and engaged him to take full stenographic notes of the argument, which he did, the argument occupying two days. We subsequently engaged him to take down and write out the judge's opinion delivered in granting the motion, of which opinion he furnished us two copies.

We further certify that in our opinion Mr. Easton's account of $36.25 for his services is reasonable and just.

GEORGE B. CORKHILL,
United States District Attorney, District of Columbia.
RANDOLPH COYLE,
Assistant United States Attorney, District of Columbia.

O

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. DOC. No. 60.

BURNING OF LIGHT-HOUSE TENDER LILY.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING

A letter from the Light-House Board in regard to the burning of the light-house tender Lily, and asking an appropriation of $5,000 *to pay losses of officers and men.*

JANUARY 5, 1885 —Referred to the Committee on Appropriations and ordered to be printed.

TREASURY DEPARTMENT,
December 20, 1884.

SIR: I have the honor to transmit herewith a letter of the Light-House Board, dated the 5th instant, in regard to the burning of the light-house tender Lily at Cincinnati, Ohio, on September 20, 1884, and inclosing claims of the officers and men of the vessel for reimbursement of losses of their private effects, with the recommendation that Congress be asked to appropriate $5,000 for the purpose.

I have, accordingly, respectfully to transmit these papers so that action may be taken by Congress in the matter, if it appears wise to do so, agreeably to the desire of the Light-House Board.

Very respectfully,

H. McCULLOCH,
Secretary.

Hon. J. G. CARLISLE,
Speaker of the House of Representatives.

TREASURY DEPARTMENT,
OFFICE OF THE LIGHT-HOUSE BOARD,
Washington, December 5, 1884.

SIR: I have the honor to call your attention to some facts connected with the burning of the light-house tender Lily, which took place on the 20th of September last, while lying at her berth, at Cincinnati, Ohio. The low water existing in the Ohio River at that time made it imperative to select a berth for the Lily, where she was crowded by other

steamboats, and one of these (the Morning Mail) taking fire, the conflagration was communicated to the Lily before she could be removed from danger. A board of investigation appointed for the purpose has reported that every possible precaution was taken; that the officers and men were at their posts and fought the fire courageously until driven from the boat.

Besides the public property destroyed by this fire, the officers and men suffered a considerable loss by the burning of their private effects. As it is believed that every exertion was made to save the vessel, the Board has to recommend that an appropriation be asked of Congress to reimburse those who have suffered loss.

A number of claims of this nature have been received at this office, and copies of them are herewith inclosed. It is believed that an appropriation of $5,000 will be sufficient to meet all demands.

Very respectfully,

HENRY F. PICKING,
Commander, United States Navy,
Naval Secretary.

The Hon. SECRETARY OF THE TREASURY.

OFFICE OF LIGHT-HOUSE INSPECTOR, FOURTEENTH DISTRICT,
Cincinnati, Ohio, November 20, 1884.

SIR: I respectfully submit the following sworn statement of my personal losses, caused by the burning of the light-house tender Lily on September 20, 1884, asking the consideration of the Board and its favorable recommendation to Congress for relief in any amount deemed just and fair.

I attach to this letter a statement of the losses of my family, who had nearly everything they possessed in the way of clothing and trinkets stored on board the Lily in the inspector's cabin, while awaiting for rooms at the Grand Hotel, they being in the country—but with no thought of relief, only to better give an idea of my losses—during the terrible six minutes the steamer was burning.

Very respectfully,

A. G. KELLOGG,
Commander, United States Navy, Light-House Inspector, Fourteenth District.

Vice-Admiral STEPHEN C. ROWAN, U. S. N.,
Chairman of Light-House Board, Washington, D. C.

MEMORANDA.

	Value.
My wife's wardrobe, including 2 India shawls	$1,500 00
Daughter's wardrobe	100 00
Son's wardrobe	50 00
1 sewing-machine	35 06
Crib and carriage	50 00
2 eider spreads	30 00
Cabinets, pictures, books, and all that goes with a small family.	
	1,765 00

CINCINNATI, OHIO, *November* 10, 1884.

The following articles belonging to me were on board the light-house tender Lily and destroyed at time of conflagration, September 20, 1884:

	Value.
1 uniform coat, undress	$50 00
1 uniform trousers	15 00
1 japanned box for uniforms	5 00
1 uniform suit, jacket and trousers	30 00
1 evening dress suit	65 00
1 morning jacket	18 00
3 suits, $25 each	75 00

	Value.
1 overcoat and 1 boat-cloak	$75 00
1 shooting suit	15 00
1 chapeau	15 00
1 japanned box for chapeau	3 00
1 sword	18 00
2 sword-knots	10 00
3 hats	7 00
1 storm suit	10 00
1 dozen shirts	30 00
Cuffs, collars, gloves, ties, and socks	25 00
Underclothing	25 00
	491 00

I could continue this list with every little article I had, the accumulation of my life, pictures, correspondence, official orders, and articles extending all the way from a card plate to a shooting-trap and barrel of clay pigeons.

I declare this to be a true statement of my losses. In almost every case I have tried to give the actual values, and not those required to replace. I believe that in the articles of library and silver ware double the amount could not replace them.

Very respectfully,

A. G. KELLOGG.

STATE OF OHIO,
County of Hamilton:

A. G. Kellogg makes oath and says he is the above-named claimant, and that the statements set forth in his above claim are just, true, and correct.

A. G. KELLOGG.

Sworn to before me and signed in my presence this 11th day of November, A. D. 1884.
[SEAL.]
REUBEN TYLER,
Notary Public, Hamilton County, Ohio.

CINCINNATI, OHIO, *November* 20, 1884.

SIR: The following articles belonging to me were on board the light-house tender Lily, and destroyed at time of conflagration, September 20, 1884:

	Value.
1 pair shoes	$5 00
2 pair pants	6 00
4 shirts	1 50
2 suits underwear	3 00
This affidavit	40
Total	15 90

Very respectfully,

EDWARD REED.

Commander A. G. KELLOGG, U. S. N.,
Light-house Inspector, Fourteenth District.

Sworn and subscribed to before me this 20th day of November, A. D. 1884.
[SEAL.]
EDWARD GILLIGAN,
Notary Public in and for Hamilton County, Ohio.

OFFICE OF LIGHT-HOUSE INSPECTOR, FOURTEENTH DISTRICT,
Cincinnati, Ohio, November 29, 1884.

SIR: In completion of the list of personal losses furnished the Board November 20, I inclose herewith the sworn statement of Edward Reed, employed as assistant cook on light-house tender Lily at time of her destruction, September 20, 1884. During the conflagration he assisted in saving the vessel and other Government property, and respectfully asks for relief in the sum named ($15.90).

Very respectfully,

A. G. KELLOGG,
Commander United States Navy, L. H. Insp. Fourteenth District.

Vice-Admiral STEPHEN C. ROWAN, U. S. N.,
Chairman of Light-House Board, Washington, D. C.

CINCINNATI, OHIO, *November* 10, 1884.

SIR: The following articles belonging to me were on board the light-house tender Lily, and destroyed at time of conflagration, September 20, 1884:

	Value.
1 pair boots	$4 00
1 pair shoes	1 00
1 working coat	5 00
1 pair pants	1 00
1 vest	1 00
1 hat	2 00
1 razor strop	1 00
Total value	15 00

Very respectfully,

W. H. FOGG.

Commander A. G. KELLOGG, U. S. N.
Light-house Inspector, Fourteenth District.

STATE OF OHIO,
Hamilton County, ss:

Personally appeared before me the undersigned, a notary public within and for said county, W. H. Fogg, who, being duly sworn, says on oath that the foregoing statement of articles belonging to him were on board the light-house tender Lily at the time of its destruction by fire, as stated aforesaid, and that the said statement of loss is correct.

W. H. FOGG.

Sworn to and subscribed before me this 11th day of November, 1884.
[SEAL.]
GEO. H. HIGH,
Notary Public, Hamilton County, Ohio.

CINCINNATI, OHIO, *November* 10, 1884.

SIR: The following articles belonging to me were on board the light-house tender Lily, and destroyed at time of conflagration, September 20, 1884:

	Value.
1 pair working pants	$3 00
2 pair working pants ($2.50)	5 00
1 pair shoes	3 00
1 cap	75
1 cook's apron	50
Total value	12 25
Affidavit	40

Very respectfully,

his
THOMAS + GRIMES.
mark.

Commander A. G. KELLOGG, U. S. N.,
Light-house Inspector, Fourteenth District.

Witnesses to signature
M. S. ANDERSON,
JOHN W. HENSHEW.

Sworn and subscribed to before me this 12th day of November, A. D. 1884.
[SEAL.]
EDWARD GILLIGAN,
Notary Public, Hamilton County, Ohio.

CINCINNATI, OHIO, *November* 18, 1884.

SIR: The following articles belonging to me were on board the light-house tender Lily, and destroyed at time of conflagration, September 20, 1884:

	Value.
2 suits of clothes	$75 00
9 shirts	22 50
1 dozen handkerchiefs	6 00
3 suits winter underwear	9 00
3 suits summer underwear	6 00
9 pairs cuffs	3 15
12 collars (linen), at 20 cents	2 40
2 hats	6 50
1 cap	2 00
7 pairs socks	3 50
1 pair gum boots	4 00
2 pair gloves	2 00
1 valise	7 00
1 hand satchel	4 00
4 razors	6 00
Razor strop and hone	1 50
Shaving cup and brush	1 25
1 pair slippers	2 50
1 pair boots	10 00
1 pair shoes	7 00
1 gum coat	4 00
1 comb and brush	2 25
Clothes-brush and broom	1 25
Blacking-brush	50
Tooth-brush	50
1 pair suspenders	75
1 gold fountain pen	4 00
1 writing desk	19 00
1 book-case	27 00
1 set Johnson's Encyclopedia	18 00
Other books	31 00
1 barometer	18 00
1 thermometer	1 50
1 lamp and shade	10 00
Loyal Legion badge	15 00
Army of Cumberland badge	20 00
1 Dallmeyer photographic lens	72 00
1 Blair photographic camera	40 00
Photographic outfit	10 00
Total value	476 05

The above does not cover my losses by at least $1,000, as I had many ornaments in the way of pictures and mementos of a lifetime, on the boat, which of course I could not include in this list.

Very respectfully,

GEO. A. VANDERGRIFT.

Commander A. G. KELLOGG, U. S. N.,
Light-house Inspector, Fourteenth District.

STATE OF OHIO,
Hamilton County, ss:

George A. Vandergrift makes oath and says that the statements in the foregoing statement of losses is correct to the best of his knowledge and belief.

GEO. A. VANDERGRIFT.

Sworn to before me and subscribed in my presence this 19th day of November, 1884.

[SEAL.]

SILAS E. HURIN,
Notary Public, Hamilton County, Ohio.

CINCINNATI, OHIO, *November* 10, 1884.

SIR: The following articles belonging to me were on board the light-house tender Lily, and destroyed at time of conflagration, September 20, 1884:

	Value.
1 dress-coat, vest, and pants	$30 00
1 overcoat	20 00
3 suits underclothes	9 00
1 working suit	20 00
10 shirts	10 00
1 pair shoes	4 00
12 linen collars	3 00
½ dozen handkerchiefs	2 10
½ dozen socks	3 00
2 hats	4 00
	105 10

Very respectfully,

EDWARD HUGHES.

Commander A. G. KELLOGG, U. S. N.,
Light-House Inspector, Fourteenth District.

STATE OF OHIO,
Hamilton County, ss:

Personally appeared Edward Hughes, who, upon being duly sworn according to law, says that the above statement of personal loss by the burning of steamer Lily, amounting to the sum of $105.10, is true, and further the deponeth saith not.

EDWARD HUGHES.

Subscribed in my presence and sworn to before me this 12th day of November, 1884.
[SEAL.]

J. C. CAMBELL,
Notary Public, Hamilton County, Ohio.

CINCINNATI, OHIO, *November* 10, 1884.

SIR: The following articles belonging to me were on board the light-house tender Lily, and destroyed at time of conflagration, September 20, 1884:

	Value.
1 overcoat	$3[illegible] 00
1 dress-coat, vest, and pants	35 00
1 business coat, vest, and pants	28 00
10 shirts	10 50
3 suits underwear	7 50
6 pairs cuffs	1 50
1 dozen linen collars	1 50
9 pairs socks	3 00
2 pairs boots	18 00
1 pair shoes	7 00
2 hats	6 50
10 handkerchiefs	3 00
2 pairs pants	13 00
Total value	172 50

Very respectfully,

W. H. BOONE.

Commander A. G. KELLOGG, U. S. N.,
Light-House Inspector, Fourteenth District.

STATE OF OHIO,
County of Hamilton, ss:

W. H. Boone makes oath and says that the statements set out in his foregoing claim, signed by him, are true and correct.

W. H BOONE.

Sworn to before me and signed in my presence this 14th day of November, A. D. 1884.
[SEAL.]

RUBEN TYLER,
Notary Public, Hamilton County, Ohio.

OFFICE OF LIGHT-HOUSE INSPECTOR,
FOURTEENTH DISTRICT,
Cincinnati, Ohio, November 20, 1884.

SIR: I have the honor to inclose herewith the sworn statements furnished by the employés of light-house tender Lily, of their personal losses sustained at time of her destruction, September 20, 1884.

These persons devoted their entire time to saving the vessel and other Government property, as stated September 24 in report of investigating committee appointed by Light-House Board, and they each respectfully ask for relief in the sums named, as follows:

George A. Vandegrift, master	$476 05
Sidney Milner, mate	130 00
F. M. Magers, engineer	23 50
W. E. Baxter, carpenter	109 50
George Gardner, quartermaster	93 00
W. N. Boone, steward	172 50
Edward Hughes, cabin boy	105 10
William Hughes, cabin boy	81 05
Thomas Grimes, cook	12 65
Joseph Fister, deck hand	43 75
W. H. Fogg, deck hand	15 00
Total	1,262 10

John Nelson, striker, and Edward Reed, assistant cook, employed at the same time on Lily, have not as yet furnished any statement of their respective losses.

Very respectfully,

A. G. KELLOGG,
Commander United States Navy, Light-House Inspector, Fourteenth District.

Vice-Admiral STEPHEN C. ROWAN, U. S. N.,
Chairman Light-House Board, Washington, D. C.

MADISEN, IND., *November* 11, 1884.

SIR: According to your instruction, I send you a list of what I lost on steamer Lily when burned:

	Value.
2 volumes Appleton's Encyclopedia	$15 00
1 volume, 20,000 receipts	2 50
1 valise	4 00
2 hammers	2 00
Total	23 50

F. M. MAGERS,
Engineer United States Lily.

Commander A. G. KELLOGG, U. S. N.
Light-House Inspector, Fourteenth District.

JEFFERSON COUNTY,
State of Indiana.

Personally appeared before me this day the within F. M. Magers, and being duly sworn, says the within statement is true as he verily believes.

[SEAL.]

ALMOND DANIELLS,
Notary Public.

MADISEN, *November* 11, 1884.

STATE OF INDIANA,
County of Floyd.

George Gardner, being duly sworn upon his oath, says that he was on the light-house tender Lily, September 20, 1884, when it burned, as an employé of the Government of the United States, and that he lost the following clothing, &c., by said fire, to wit:

	Value.
Two full suits of clothing	$50 00
½ dozen suits of underclothing	9 00
4 white shirts	6 00
2 pairs boots	12 00
Collars, collar buttons, &c	10 00
4 books	6 00
	93 00

And he avers his loss to be the amount stated.

GEORGE GARDNER.

Subscribed and sworn to before me this 10th day of November, 1884.
[SEAL.]

EDWARD G. HENRY,
Notary Public.

CINCINNATI, OHIO, *November* 10, 1884.

SIR: The following articles belonging to me were on board the light-house tender Lily, and destroyed at time of conflagration, September 20, 1884:

	Value.
1 shirt	$2 50
1 pair boots	6 50
3 pair pants	9 00
1 hat	1 50
2 vests	4 00
2 dress coats	13 00
2 suits underwear	3 00
3 working-shirts	1 50
3 pair socks	75
1 razor	1 50
1 razor-strap	50
Total value	43 75

Very respectfully,

JOSEPH FISTER.

Commander A. G. KELLOGG, U. S. N.,
Light-house Inspector, Fourteenth District.

STATE OF OHIO,
Hamilton County, ss:

Joseph Fister, being first duly sworn, says the facts stated in the above account are true.

JOSEPH FISTER.

Sworn to and subscribed before me this 10th day of November, A. D. 1884.
[SEAL.]

ALFRED B. BENEDICT,
Notary Public, Hamilton County, Ohio.

CINCINNATI, OHIO, *November*, 10, 1884.

SIR: The following articles belonging to me were on board the light-house tender Lily, and destroyed at time of conflagration, September 20, 1884.

	Value.
1 artificial leg	$75 00
1 dress coat, vest and pants	24 00
1 business coat, vest and pants	22 00
1 pair boots	9 00
Total value	130 00

Very respectfully,

SIDNEY MILNER.

Commander A. G. KELLOGG, U. S. N.,
Light-House Inspector, Fourteenth District.

STATE OF OHIO,
Hamilton County, ss.:

Personally appeared before me, a notary public within and for the county and State aforesaid, Sidney Milner, who, being duly sworn, says the above inventory of articles lost on board the light-house tender Lily is in every respect just and true; that said goods were reasonably worth the amount set opposite in said inventory, and that he has received no compensation or remuneration whatever therefor.

SIDNEY MILNER.

Sworn and subscribed to before me this 11th day of November, 1884.
[SEAL.]

P. J. JONES,
Notary Public.

CINCINNATI, OHIO, *November* 10, 1884.

SIR: The following articles belonging to me were on board the light-house tender Lily, and destroyed at time of conflagration, September 20, 1884:

	Value.
1 overcoat	$18 00
2 dress coats, vests and pants	36 00
2 suits underwear	4 00
5 linen shirts, 75 cents	3 72
1 pair shoes	4 00
2 hats	3 50
1 dozen linen collars	1 80
4 pair cuffs	80
1 pair dress pants	5 00
1 dozen satin neckties	1 50
½ dozen linen handkerchiefs	1 20
1 silk muffler	1 50
Total value	81 05

Very respectfully,

WILLIAM HUGHES.

Commander A. G. KELLOGG, U. S. N.,
Light-House Inspector, Fourteenth District.

STATE OF OHIO,
Hamilton County, ss:

William Hughes, being first duly sworn, says that the foregoing statement and account are true, as he verily believes.

WILLIAM HUGHES.

Sworn to before me and subscribed in my presence this 11th day of November, 1884.
[SEAL.]

JAMES J. MUIR,
Notary Public, Hamilton County, Ohio.

NOVEMBER 11, 1884.

Lost by fire on light-house tender Lily, September 20, 1884.

	Value.
4 pairs of boots	$20 00
1 suit of clothes	17 00
2 pairs of pants	7 00
1 pair of slippers	1 50
8 shirts, collars and cuffs	12 00
6 suits of underwear	12 00
6 pairs of socks	2 00
10 handkerchiefs	2 50
3 pairs of gloves	5 00
4 razors, cup and brush	7 50
2 razor-straps	2 00
1 pair of cuff-buttons	7 00
1 umbrella	4 00
1 valise	8 00
3 caps	2 00
Total	109 50

W. E. BAXTER,
Carpenter.

STATE OF INDIANA,
Jefferson County.

Personally appeared before me this the 11th day of November, 1884, the within-named W. E. Baxter and, being duly sworn, says that the within statement is true, as he verily believes.

[SEAL.]

ALMOND DANIELLS,
Notary Public.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. Doc. No. 61.

FALLS OF SAINT ANTHONY.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

The report of the Chief of Engineers in regard to the condition of the Falls of Saint Anthony.

JANUARY 5, 1885.—Referred to the Committee on Rivers and Harbors and ordered to be printed.

WAR DEPARTMENT,
Washington City, December 20, 1884.

SIR: The Secretary of War has the honor to transmit to the House of Representatives a letter, dated the 17th instant, from the Chief of Engineers, together with a copy of a report, dated the 5th instant, from Maj. C. J. Allen, Corps of Engineers, in regard to the condition of the Falls of Saint Anthony, based upon examinations of the Government works at that locality made during portions of the months of September and November, 1884.

ROBERT T. LINCOLN,
Secretary of War.

The SPEAKER *of the House of Representatives.*

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., December 17, 1884.

SIR: I have the honor to submit the inclosed copy of a communication to this office, dated the 5th instant, from Maj. C. J. Allen, Corps of Engineers, in regard to the condition of the Falls of Saint Anthony, based upon examinations of the Government works at that locality made during portions of the months of September and November, 1884, with recommendation that it be sent to the Speaker of the House of Representatives for the information of the Committee on River and Harbors, and such action as the case may seem to require.

Major Allen shows very clearly the dangerous condition of the Falls and the necessity that measures be taken at an early day for their pro-

tection and preservation. He states, also, that much of the injury to the Falls is due to the obstructions caused by deposits of rock, earth, and gravel, made by private parties in Minneapolis, above the apron during the winter of 1881–'82, &c.

Copy of the drawing accompanying his report is also submitted herewith.

Very respectfully, your obedient servant,

JOHN NEWTON,
Chief of Engineers,
Brig. and Bvt. Maj. Gen.

Hon. ROBERT T. LINCOLN,
Secretary of War.

REPORT UPON THE PRESENT CONDITION OF THE FALLS OF SAINT ANTHONY.

ENGINEER OFFICE, UNITED STATES ARMY,
Saint Paul, Minn., December 5, 1884.

GENERAL: I beg leave to submit the following report upon the condition of the Falls of Saint Anthony:

Examinations of the Government works were commenced in September last, but a sudden rise in the river deferred further examination until the latter part of November.

The apron has settled in a number of places; the planking of the apron and angle nearly all needs renewing, and the timber-wing at A—B is entirely undermined and dilapidated. (Please see tracing herewith.)

The principal works constructed by the Government for the preservation of the Falls are:

1. A concrete dike, about 1,870 feet long, extending entirely across the width of the river, under the limestone ledge of the Falls, to prevent the cutting away of the soft sand rock underlying the limestone. This dike was completed in 1876.

2. Rolling dams, completed in 1876, and designed to maintain, during the winter season, sufficient depth of water over the limestone to prevent injurious action upon it of ice and frost.

3. A timber apron and wing at and below the crest of the Falls to prevent undermining of the sand rock and consequent recession of the crest.

The angle, as it is called, has always been regarded as the most exposed point in the Government works on account of its proximity to the extensive break of 1871 under the limestone; it is also less than 150 feet distant from the concrete dike, for the protection of which the apron and wing were constructed.

The erosion and undermining in the angle and along A—B are largely due to the effect of deposits of rock, earth, and gravel made in the channel of the river above the apron in the winter of 1881 and '82, by private parties in Minneapolis, the material deposited infringing 118 feet upon the already too narrow waterway and throwing an undue proportion of the discharge of water into the angle.

The erosion, since the winter of 1881 and 1882, just below the wing, at the point marked "E" on the tracing, is undoubtedly due, to some extent, to the effect of the deposits just mentioned, but more particularly to an attempt, during that winter, by parties claiming the

right to the water-power on the east side, to tunnel under Farnham & Lovejoy's mill-pond. An injunction, served at the instance of the parties using the mill-pond, stopped the tunneling, but the excavation had progressed far enough to expose a small face of sand rock to the action of high water, so that, since the winter of 1881 and '82 the limestone ledge has receded about 40 feet. A strong eddy sets into the bay thus excavated and, passing under the timber work A—B, contributes materially to the undermining now going on.

The deposits made in the channel above the apron have been noted in the annual reports since 1882, inclusive. Suit was commenced in the United States district court in the spring of 1882 to compel the removal of the deposits, which removal was finally effected during the summer and fall of 1883.

It can be seen by the tracing herewith that the mills and other private works occupy about two-thirds of the bed of the river, and that through the remaining third (the middle of the stream) the flood, as well as low-water volumes, must discharge, such quantities excepted as may be drawn through the mills for working the wheels. Thus volumes of from 5,000 to 40,000 cubic feet of water per second plunge over the apron, through a width of 450 feet, narrowing to 350 feet at the foot of the apron, and through heights of 40 to 45 feet to act upon the soft sand rock forming the bed of the river below the Falls.

Many of the water-power companies' dams are leaky and in dilapidated condition, and although they contract the bed of the river, as already stated, the preservation of the Government works under their present plan and extent largely depends upon the preservation of the mill-dams. The rolling dams, apron and wing, abut or rest upon dams built by the corporations or companies. Should the dams belonging to the latter go to pieces, through neglect or otherwise, the Government works would be flanked by the stream and ultimately destroyed. For example, the rolling dams, built for the purpose of keeping the limestone ledge flooded during winters in order to prevent frost and ice from scaling off the top layers of the limestone, abut against the mill and water-power companies' dams at the points D, F, G, and H. Should the companies' dams not be maintained, the rolling dams would be flanked and rendered null for the purposes for which they were built, and, besides, the water flanking the rolling dam and apron at the points H, H, H, for instance, where the mill-dam is much dilapidated, would add to the undermining in the angle and below it, and so on for other parts of the crest occupied by works of private parties. As the erosion proceeds, the limestone crest recedes, the concrete dike is neared, and all the protection works are endangered.

I have at different times and especially within the past two months, communicated with the representatives of the Mill and water power companies as to the dangerous condition of the Falls. So far as I understand the matter, the control of the water power on the east side is in litigation, and until the questions involved are settled by the courts no improvement of consequence in the condition of the private dams can be looked for.

Congress made the first appropriation for the preservation of the Falls in 1870, since which time the Government has expended upon them about $600,000 in extensive works.

In view of the increasing difficulties encountered in preserving the Government works at the Falls of Saint Anthony, I feel it a duty to call attention to the necessity of adequate appropriations, as estimated for in the annual reports of the Engineer in charge, as well as to

the necessity of legislation to prevent abuse of, or trespass upon, the Government works.

The last Congress appropriated for "Improvements at the Falls of Saint Anthony, Minnesota, repairs to and preservation thereof, $10,000." This sum is totally inadequate for repairs immediately necessary. It will, however, be applied, this winter, to replanking the angle and strengthening the wing A–B, in the hope of tiding over the spring floods.

Very respectfully, your obedient servant,

CHAS. J. ALLEN,
Major of Engineers.

Brig. Gen. JOHN NEWTON,
Chief of Engineers, U. S. A.

SAINT ANTHONY MILL POND

FARNHAM AND LOVEJOY'S MILL POND

MISSISSIPPI RIVER

MINNEAPOLIS MILL COMPANY'S POND

Break July 3rd 1871

Break April 1875

Factory

Second break Original channel in lime-stone

First break in lime-stone Oct 1869.

Break May 13th 1875

Break of July 1871

Break of July 1875

Ledge Winter 1884

Ledge Winter 1882

Shore Line 1884

Shore Line 1878

Angle A-B

H H H

G

F

D

E

Rolling Dam built 1876

Concrete Dyke

Lower rolling dam built in 1876

Crest of Falls 1868

Crest of Falls 1857

Bassett's Spoil Banks

Head of lime-stone ledge

Minneapolis Mill Co's Saw mills

Platform

Bridge

Cotton Mill

Gate House

Canal

J.B. Bassett & Co Saw Mill

City Waterworks

N

MAP OF FALLS OF ST. ANTHONY MINNESOTA

Accompanying Major Allen's letter of Dec. 5th 1884

Scale.

0 20 40 60 80 100' 200' 300'

H. EX. 61, 2, 48.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. DOC. No. 62.

CADETS AT MILITARY ACADEMY.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

Petition of cadets at Military Academy, class of 1886, *for legislation to secure appointments in the Army to members of said class.*

JANUARY 6, 1885.—Referred to the Committee on Military Affairs and ordered to be printed.

WAR DEPARTMENT,
Washington City, January 5, 1885.

The Secretary of War has the honor to transmit to the House of Representatives a petition dated the 13th ultimo, from the class which will be graduated at the United States Military Academy at West Point in June, 1886, praying for legislation which will secure appointments in the Army for those cadets who may be graduated in 1886.

ROBERT T. LINCOLN,
Secretary of War.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

WEST POINT, N. Y., *December* 13, 1884.

SIR: I have the honor to forward to you the inclosed petitions from the class which graduates in June, 1886, and to request that they be transmitted at your earliest convenience, through the honorable Secretary of War, one to the House of Representatives and the other to the Senate.

I am, sir, very respectfully,

JOHN J. PERSHING,
President of the Class.

The ADJUTANT-GENERAL, U. S. ARMY,
Washington, D. C.

[First indorsement.]

HEADQUARTERS UNITED STATES CORPS CADETS,
West Point, N. Y., December 14, 1884.

Respectfully forwarded.

H. C. HASBROUCK,
Lieutenant-Colonel, Commandant of Cadets.

[Second indorsement.]

HEADQUARTERS UNITED STATES MILITARY ACADEMY,
West Point, New York, December 15, 1884.

Respectfully forwarded to the Adjutant-General, United States Army.

The request of the petitioners for legislation which will secure appointments in the Army for the graduates in 1886 is approved.

W. MERRITT,
Colonel Fifth Cavalry, Bvt. Maj. Gen. U. S. A., Superintendent.

[Third indorsement.]

Respectfully submitted to the Secretary of War.

R. C. DRUM,
Adjutant-General.

ADJUTANT-GENERAL'S OFFICE,
December 16, 1884.

To the Honorable the Senate and House of Representatives of the United States in Congress assembled:

The petition of the undersigned, cadets of the United States Military Academy and members of the class which will graduate in June, 1886, respectfully showeth:

That said class now has eighty-two members, about eighty of whom will probably graduate;

That under existing laws the number of vacancies that there will probably be in the grade of second lieutenant in the Army in June, 1886, will be less than the number of graduates of that year, some of whom will therefore fail to receive promotion and will be discharged from the service;

That the number of vacancies in said grade would in all probability be sufficient for said class, provided that no vacancies were filled by civilian appointments during the year preceding June, 1886;

Your petitioners, hoping by hard study and faithful attention to the duties of their present grade to merit and to receive the recommendation of the Academic Board for promotion to the rank of commissioned officers of the Army, do therefore pray that by appropriate legislation such relief may be granted them as in the premises may be deemed just.

Your petitioners, as in duty bound, ever pray.

Henry C. Newcomer, Illinois.
A. D. Andrews, New York.
Edward M. Lewis, Indiana.
Edward C. Brooks, Oregon.
Letcher Hardeman, Missouri.
John A. Towers, South Carolina.
Seward Mott, New York.
Amos B. Shattuck, New Hampshire.
Marcus Maxwell, Arkansas.
J. McI. Carter, Missouri.
George J. Godfrey, New York.
James H. McRae, Georgia.
Frank L. Winn, Kentucky.
C. C. Ballou, Illinois.
John E. McMahon, New York.
Charles S. Riché, Pennsylvania.
Chas. G. Dwyer, Texas.
G. W. Stevens, Louisiana.
Wm. Geo. Elliot, District of Columbia.
Frank B. Fowler, Texas.
Warren C. Owen, Ohio.
P. E. Traub, New York.
Joseph C. Byron, New York.
William M. Swaim, New Mexico.
C. M. Pettit, New York.
E. W. McCaskey, Pennsylvania.
Dwight E. Holley, Connecticut.
Chas. L. Potter, Maine.
Edmund S. Wright, Kentucky.
Robert G. Procter, Kentucky.
Chas. G. Lyman, At Large.
Walter N. P. Darrow, New York.
F. C. Kimball, Maine.
Benj. R. Poore, Massachusetts.
Chas. T. Menoher, Pennsylvania.
William H. Wilder, North Carolina.
Thos. H. Rees, Michigan.
David E. Twiggs, Georgia.
Harry Fenland, Maryland.
Walter H. Gordon, Louisiana.
Edward N. Jones, jr., Alabama.
David W. Fulton, Illinois.
John J. Pershing, Missouri.
George Deshue, Massachusetts.
James E. Nolan, Wisconsin.
Wm. H. Hay, Florida.
J L. Druiew, Kentucky.
G. W. Cole, Missouri.
Samuel Reber, Missouri.
George B. Davis, New York.
Henry C. Keene, jr., Massachusetts.
Frank G. Kalk, Wisconsin.
Jno. T. Haines, At Large.
Bertram T. Clayton, Alabama.
Thomas B. Mott, Virginia.
Floyd W. Harris, West Virginia.
Chas. C. Walcott, jr., Ohio.
A. D. Niskern, Michigan.

Cecil Stewart, California.
Jno. T. Nance, Illinois.
Chauncey B. Baker, Ohio.
Arthur Thayer, Indiana.
Frank McIntyre, Alabama.
Richard C. Croxton, Virginia.
Lucien G. Berry, New York.
Wm. H. Camp, Wisconsin.
Julius A. Penn, Ohio.
Stephen H. Elliott, Texas.
A. I. Lasseigne, Louisiana.
Jas. H. Frier, Missouri.
L. Loyd Durfee, Ohio.
R. L. Hirst, Pennsylvania.
M. M. Patrick, West Virginia.
Arthur Johnson, Minnesota.
Geo. B. Duncan, Kentucky.
Malvern Hill Barnum, New York.
Erneste V. Smith, Missouri.
D. J. Baker, jr., Illinois.
Sam. Seay, jr., Tennessee.
R. C. Williams, Ohio.
Harry G. Trout, Pennsylvania.
William H. Bean, Pennsylvania

WEST POINT, N. Y., *December* 13, A. D. 1884.

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 63.

CIVIL EMPLOYÉS, NAVY DEPARTMENT.

LETTER

FROM

THE SECRETARY OF THE NAVY,

TRANSMITTING

Statement showing names of civil employés of the Navy Department, the time they were employed, and the sums paid for their services.

JANUARY 6, 1885.—Referred to the Committee on Expenditures in the Navy Department and ordered to be printed.

NAVY DEPARTMENT,
Washington, January 5, 1885.

SIR: I have the honor to transmit herewith, in compliance with section 194, Revised Statutes, a report of the civil employés on the rolls of this Department during the calendar year 1884, embracing a statement of the time each was actually employed and the sums paid to each.

The force of the Department now authorized is usefully employed, and no reduction can be made at this time without detriment to the public service.

Very respectfully,

WM. E. CHANDLER,
Secretary of the Navy.

Hon. JOHN G. CARLISLE,
Speaker of the House of Representatives.

List of clerks and other employés of the Navy Department during the calendar year 1884.

Name.	Position.	Time employed.	Amount.
John W. Hogg	Chief clerk	Whole year	$2,500 00
F. H. Stickney	Disbursing clerk	do	2,250 00
William P. Moran	Fourth-class clerk	do	1,800 00
W. S. McNairy	do	do	1,800 00
Jesse E. Dow	do	do	1,800 00
H. S. Bowen	do	do	1,800 00
James Patterson	do	July 10 to December 31	856 00
J. E. Potts	Third-class clerk	Whole year	1,600 00
Wythe Denby	do	do	1,600 00
R. T. Cheyney	do	do	1,600 00
B. W. Hanna	Stenographer	do	1,600 00

List of clerks and other employés of the Navy Department, &c.—Continued.

Name.	Position.	Time employed.	Amount.
Joseph A. Walker	Stenographer, at $1,400	September 27 to December 31	$365 22
R. B. Porter	Second-class clerk	Whole year	1,400 00
C. H. Ridenour	do	do	1,400 00
W F. Clarke	do	January 1 to July 6	722 80
M. L. Croxall	do	July 7 to December 31	677 20
J. B. Gould	do	January 1 to July 9	734 22
M. S. Thompson	do	July 10 to December 31	665 78
M. L. Croxall	First-class clerk	January 1 to July 6	619 57
J. W. Anderson	do	July 7 to December 31	580 43
H. W. King	do	Whole year	1,200 00
John Cassin	do	do	1,200 00
W. R. Handy	do	do	1,200 00
J. H. Kirkwood	do	do	1,200 00
Daniel R. Neal, jr	do	do	1,200 00
J. de Bree Higgins	do	January 1 to July 9	629 35
James C. Dulin	do	July 10 to December 31	570 65
Rufus Prentice	Clerk, at $1,000	Whole year	1,000 00
J. E. Trudeau	do	do	1,000 00
D. J. Evans	do	January 1 to July 9	524 45
Hattie E. Phelps	do	July 10 to December 31	475 55
James C. Dulin	do	January 1 to July 9	524 45
M. M. Heath	do	July 10 to December 31	475 55
M. Thompson	Telegraph operator	Whole year	1,000 00
James Burke	Carpenter	January 1 to February 11	115 40
P. T. McCurdy	do	February 12 to December 31	884 60
Lindsay Muse	Messenger	Whole year	840 00
William Pierce	do	do	840 00
W. R. Browne	Assistant messenger	do	720 00
J. M. Waters	do	do	720 00
William F. Thomas	do	do	720 00
William M. Ellis	do	do	660 00
John M. Evans	Laborer	do	660 00
H. Wiggenton	do	do	660 00
William Wilkes	do	do	123 30
Randolph Green	do	January 1 to March 8	536 70
E. S. Cassin	do	March 9 to December 31	77 33
W. C. Mason	Messenger boy, at $420	January 1 to March 7	342 67
W. B. Groat	do	March 8 to December 31	195 82
W. C. Mason	Telegraph messenger boy, at $240	do	
Total			47,387 04
BUREAU OF YARDS AND DOCKS.			
A. E. Merritt	Chief clerk	Whole year	1,800 00
George Mackay	Draughtsman	do	1,800 00
D. J. Partello	Fourth-class clerk	do	1,800 00
R. H. Yeatman	Third-class clerk	do	1,600 00
Charles Fair	Second-class clerk	do	1,400 00
J. R. Graham	First-class clerk	do	1,200 00
J. A. Kingsley	Clerk, at $1,000	do	1,000 00
N. Addison	Assistant messenger	do	720 00
Frederick Mason	Laborer	do	660 00
Total			11,980 00
BUREAU OF EQUIPMENT AND RECRUITING.			
S. Henriques	Chief clerk	Whole year	1,800 00
W. W. S. Dyre	Fourth-class clerk	do	1,800 00
James Patterson	Third-class clerk	January 1 to July 9	839 14
J. B. Gould	do	July 10 to December 31	760 86
D. C. Morrison	Second-class clerk	Whole year	1,400 00
R. A. Church	do	do	1,400 00
J. E. Alexander	First-class clerk	do	1,200 00
E. A. Roderick	do	do	1,200 00
F. A. Wilson	do	do	1,200 00
E. C. W. Chubb	Copyist	do	900 00
Samuel K. Behrend	do	June 28 to July 9	29 42
R. L. Barrington	do	August 8 to December 31	357 10
William H. Askew	Assistant messenger	Whole year	720 00
Benjamin Harris	Laborer	do	660 00
Total			14,266 52
BUREAU OF NAVIGATION.			
Louis Waldecker	Chief clerk	Whole year	1,800 00
D. A. Denison	Third-class clerk	do	1,600 00
Frank Hamilton	Second-class clerk	do	1,400 00

List of clerks and employés of the Navy Department, &c.—Continued.

Name.	Position.	Time employed.	Amount.
BUREAU OF NAVIGATION —continued.			
H. W. Wells	Second-class clerk	Whole year	$1,400 00
John H. Brooks	First-class clerk	do	1,200 00
S. S. Howison	Clerk at $1,000	do	1,100 00
Hattie E. Phelps	Copyist	January 1 to July 9	472 00
R. F. Cromelin	do	October 13 to December 31	195 67
R. W. Dutton	Assistant messenger	Whole year	720 00
John A. Smith	Laborer	do	660 00
Dorsey T. Seville	do	do	660 00
Total			11,107 67
BUREAU OF ORDNANCE.			
T. K. Sailer	Chief clerk	Whole year	1,800 00
C. K. Stellwagen	Draughtsman	do	1,800 00
J. R. Gisburne	Third-class clerk	do	1,600 00
E. S. Brandt	Second-class clerk	do	1,400 00
S. K. Behrend	Clerk at $1,000	July 10 to December 31	475 55
C. H. Middleton	Assistant messenger	Whole year	720 00
George W. Simms	Laborer	do	660 00
Total			8,455 55
BUREAU OF CONSTRUCTION AND REPAIR.			
H. A. Goldsborough	Chief clerk	Whole year	1,800 00
William T. Powell	Draughtsman	do	1,800 00
R. Knapp	Fourth-class clerk	do	1,800 00
C. L. Hughes	Third-class clerk	do	1,600 00
W. A. Dobson	Assistant draughtsman	do	1,400 00
F E. Storm	Second-class clerk	do	1,400 00
Grace Willcox	First-class clerk	March 8 to December 31	979 12
O. C. Fisher	Assistant messenger	Whole year	720 00
Charles D. Sydnor	Laborer	do	660 00
Total			12,159 12
BUREAU OF STEAM ENGINEERING.			
W. H. H. Smith	Chief clerk	Whole year	1,800 00
George B. Whiting	Draughtsman	do	2,250 00
A. P. Maschmeyer	Assistant draughtsman	do	1,400 00
George Schultz	Second-class clerk	do	1,400 00
W. G. Shock	First-class clerk	do	1,200 00
J. H. Hoagland	do	do	1,200 00
William Wirt	Clerk at $1,000	do	1,000 00
W. B. Darrell	Assistant messenger	do	720 00
Moses Lacy	Laborer	do	660 00
R. T. Iverson	do	January	56 20
E. S. Cassin	do	February 1 to March 8	67 10
Noble Snowdon	do	March 9 to December 31	536 70
Total			12,290 00
BUREAU OF PROVISIONS AND CLOTHING.			
J. F. Denson	Chief clerk	Whole year	1,800 00
F. C. Adams	Fourth-class clerk	do	1,800 00
W. H. Doe	Third-class clerk	do	1,600 00
T. J. Lasier	do	do	1,600 00
M. S. Thompson	Second-class clerk	January 1 to July 9	734 22
J. de Bree Higgins	do	July 10 to December 31	665 78
H. E. Quinn	do	January 1 to May 7; June 11 to December 31.	1,269 24
J. K. Lewis	First-class clerk	Whole year	1,200 00
Epes Sargent	do	do	1,200 00
Mortimer Clarke	do	do	1,200 00
W. S. Gibson	do	January 1 to July 9	629 35
D. J. Evans	do	July 10 to December 31	570 65
A. B Bromwell	Copyist	Whole year	900 00
M. M. Heath	do	January 1 to July 9	472 00
F. B. Clements	do	October 1 to December 31	225 00
William Lucas	Assistant messenger	Whole year	720 00
Samuel West	Laborer	do	660 00
Total			17,246 24

List of clerks and employés of the Navy Department, &c.—Continued.

Name.	Position.	Time employed.	Amount.
BUREAU OF MEDICINE AND SURGERY.			
Daniel Carrigan	Chief clerk	January 1 to March 25	$420 33
John Peacocke	do	March 28 to September 20	870 80
Charles T. Earle	do	October 1 to December 31	450 00
E. C. Kirkwood	Third class clerk	January 1 to June 25	777 99
Benjamin White	do	July 1 to December 31	800 00
Do	Second class clerk	January 1 to June 30	700 00
W. S. Gibson	do	July 10 to December 31	665 78
M. A. Austin	First-class clerk	Whole year	1,200 00
P. B. Wood	Clerk, at $1,000	January	85 20
William A. Nestler	do	March 1 to September 15	544 36
Charles G Reynolds	do	October 1 to December 31	250 00
M. B. Clark	Assistant messenger	Whole year	720 00
Brook Shaw	Laborer	do	660 00
George Braxton	Janitor, at $600	January 1 to March 18	128 57
Augustus Valentine	do	March 19 to April 1	23 08
Raife Hunter	do	April 2 to December 31	448 30
Stephen S. White	Assistant chemist, at $480	January 1 to May 31	200 40
Augustus Valentine	Laborer	June 1 to December 31	279 60
Total			9,224 41
JUDGE-ADVOCATE-GENERAL'S OFFICE.			
W. F. Clarke	Fourth-class clerk	July 7 to December 31	870 65
C. L. Kelsey	Third-class clerk	Whole year	1,600 00
Halleck Donoho	First-class clerk	do	1,200 00
B. F. Peters	do	do	1,200 00
J. W. Anderson	Clerk, at $1,000	January 1 to July 5	513 55
Enoch L. Duffin	Laborer	January 1 to 5	9 07
William Thomas	do	January 12 to March 8	103 36
Randolph Green	do	March 9 to December 31	536 70
Total			6,033 33
COMPILATION OF NAVAL RECORDS, WAR OF THE REBELLION.			
Porter D. Haskell	First-class clerk	October 10 to December 31	270 64
S. W. Mechlin	Copyist, at $720	August 5 to December 31	291 63
Caroline Mytinger	do	October 10 to December 31	162 44
Total			724 71
HYDROGRAPHIC OFFICE.			
Thomas T. Thurlow	Second-class clerk	Whole year	1,400 00
John S. Stodder	do	do	1,400 00
A. C. Vogel	Copyist, at $900	January 1 to July 9	472 01
Do	First class clerk	July 10 to December 31	570 64
Grace Wilcox	Copyist, at $900	January 1 to March 7	165 71
M. M. Smith	do	Whole year	700 00
E A. Scott	do	do	900 00
V. G. Smith	Copyist, at $60 per month	Three months	180 00
Do	Copyist, at $900	Nine months	675 00
E. R. Knorr	Chief of drafting and engraving, at $2,400.	January 1 to July 5	1,232 61
Do	Draughtsman, at $1,200	July 7 to December 31	580 42
Gustave Herrle	Draughtsman, at $1,600	January 1 to July 6	826 09
Do	Draughtsman, at $1,800	July 7 to December 31	870 68
Max Franke	Draughtsman	Whole year	1,600 00
C. P. Bolles	Draughtsman, at $1,400	January 1 to July 6	722 83
Do	Draughtsman, at $1,500	July 7 to December 31	725 50
Chas. Mahon	Draughtsman	Whole year	1,400 00
E. E. Court	Draughtsman, at $1,300	January 1 to July 6	671 20
Do	Draughtsman, at $1,500	July 7 to December 31	725 50
J. J. Webber	Draughtsman, at $1,300	January 1 to July 6	671 20
Do	Draughtsman, at $1,400	July 7 to December 31	677 21
Leon Dessez	Draughtsman, at $1,300	January 1 to July 6	671 20
Do	Draughtsman, at $1,400	July 7 to December 31	677 21
W. M. Whiting	Draughtsman	Whole year	1,200 00
H. G. Brewer	Draughtsman, at $1,300	January 1 to July 6	671 20
Do	Draughtsman, at $1,400	July 7 to December 31	677 21
W. R Hesselbach	Draughtsman, at $1,000	January 1 to July 6	516 30
Do	Draughtsman, at $1,200	July 7 to December 31	580 42
Charles E. Birch	Engraver, at $1,500	January 1 to July 6	774 46
Do	Engraver, at $1,800	July 7 to December 31	870 68
V. L. Ourdan	Engraver, at $1,500	September 1 to December 31	497 20
J. A. Waddey	Engraver, at $1,300	January 1 to July 6	671 20
Do	Engraver, at $1,600	July 7 to December 31	773 90

List of clerks and other employés of the Navy Department, &c.—Continued.

Name.	Position.	Time employed.	Amount.
HYDROGRAPHIC OFFICE—Continued.			
J. L. Hazzard	Engraver, at $1,200	January 1 to July 6	$619 57
Do	Engraver, at $1,400	July 7 to December 31	677 21
C. T. Klatering	Engraver	Whole year	1,300 00
C. A. Kolb	do	do	1,000 00
W. P. Sefton	do	do	1,000 00
Charles La Hayne	Plate printer	do	1,560 00
Thomas Devine	do	do	1,252 00
W. F. B. Wall	Apprentice, at $400	January	34 10
Do	Apprentice, at $600	February 1 to October 31	449 40
Do	Plate printer, at $1,200	November 1 to December 31	198 90
William H. Wilson	Assistant messenger	January 1 to September 8	496 85
D. M. Goodacre	Laborer, at $660	do	455 55
Robert Adams	Office attendant, at $420	January 1 to April 30	139 60
Do	Laborer, at $660	May 1 to December 31	440 60
Thomas Lawrence	do	January 1 to April 30	219 40
Henry Johnson	Laborer	Whole year	660 00
Joseph N. Mayne	Laborer, at $660	10 months	550 60
Do	Assistant messenger	2 months	119 40
George Beanes	Laborer	Whole year	660 00
Lincoln Brown	do	do	660 00
C. A. Stephenson	Laborer, at $660	11 months	603 80
R. C. Hutchison	do	May 1 to June 30 October 7 to December 31	264 84
R. W. Johnson	do	8 months	440 60
A. A. Brittain	do	May 16 to June 30	83 41
Charles Burke	do	June 11 to 30	36 26
John R. Johnson	do	do	36 26
Do	Office attendant, at $420	August 1 to December 31	174 60
T. H. Trundle	Laborer, at $660	June 11 to 30	36 26
G. W. Smith	do	do	36 26
Charles B. Wise	do	September 10 to December 31	202 66
Total			40,355 71
NAUTICAL ALMANAC OFFICE.			
E. J. Loomis	Chief assistant	Whole year	1,600 00
G. W. Hill	Assistant	do	1,600 00
J. Morrison	do	do	1,600 00
J. Meier	Assistant, at $1,400	January 1 to December 15	1,339 15
R. W. Prentiss	do	December 16 to 30	60 85
W. F. McK. Ritter	Assistant	Whole year	1,400 00
S. J. Corrigan	do	do	1,200 00
J. O. Wiessner	do	do	1,200 00
R. W. Prentiss	Assistant, at $1,200	January 1 to December 10	1,147 82
C. Keith	do	December 16 to 31	52 18
J. Wiessner	Assistant	Whole year	1,000 00
H. Meier	do	do	1,000 00
M. B. Chase	Copyist, at $480	January 1 to July 5	246 52
Do	Copyist, at $720	July 7 to December 31	348 31
J. C. Hart	Assistant messenger	Whole year	720 00
G. W. Smith	Laborer	July 7 to December 31	319 24
Total			14,834 07
NAVAL OBSERVATORY.			
A. N. Skinner	Assistant astronomer	Whole year	1,900 00
William C. Winlock	do	do	1,500 00
H. M. Paul	do	do	1,500 00
Thomas Harrison	Fourth class clerk	do	1,800 00
William F. Gardner	Instrument maker	do	1,500 00
Denis Horigan	Watchman	do	720 00
Nicholas Cahill	do	do	720 00
William Henderson	do	do	720 00
James Burns	do	do	720 00
George Watt	Skilled laborer, at $1,000	do	1,000 00
George Anderson	Skilled laborer, at $720	do	720 00
James Kelly	Laborer	do	660 00
William D. Horigan	do	do	660 00
Do	do	do	660 00
Thomas K. Simpson	do	do	660 00
Samuel W. Watson	do	do	660 00
W. H. Malvin	do	do	660 00
John Lamkin	do	do	660 00
Henry Clay	do	do	660 00
Total			18,080 00

48TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { EX. DOC. No. 64.

REPORT OF THE MISSISSIPPI RIVER COMMISSION.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

The annual report of the Mississippi River Commission.

JANUARY 6, 1885.—Referred to the Committee on Rivers and Harbors and ordered to be printed.

WAR DEPARTMENT,
Washington City, January 5, 1885.

The Secretary of War has the honor to transmit to the House of Representatives the annual report of the Mississippi River Commission for 1884.

The estimate, $100,000, of the Commission for salaries, traveling expenses, &c., for the fiscal year 1886 will be found on page 204 of the Book of Estimates for 1885–'86 (House Ex. Doc. No. 5, Forty-eighth Congress, first session), and the three items, $500,000, $1,000,000, and $7,000,000, for continuing the improvement of the river, are included (page 168 of said document) in the amount, as reported by the Chief of Engineers, which can be profitably expended in the next fiscal year.

ROBERT T. LINCOLN,
Secretary of War.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

THE MISSISSIPPI RIVER COMMISSION,
PRESIDENT'S OFFICE,
New York, December 19, 1884.

SIR: The Mississippi River Commission have the honor to submit the following report, embracing the subjects and subdivisions specified below, to wit:

1. Progress of surveys and examinations since December 1, 1883.
2. Construction.
3. Remarks on the subject of levees and outlets.
4. General discussion of the problem of the rectification of the Red and Atchafalaya rivers.
5. Legislation.

6. Financial statements and estimates of funds for the fiscal year ending June 30, 1866, for "surveys and expenses of the Commission, and for improving Mississippi River."

PROGRESS OF SURVEYS AND EXAMINATIONS.

The surveys and examinations undertaken in pursuance of the requirements of the third section of the act under which the Commission was organized have been continued.

In the last annual report progress in this branch of work was noted to December 1, 1883. From that date to December 1, 1884, work has been accomplished in field and office as follows:

Gauges.—Daily readings have been taken and displayed at all the stations previously established. New stations have been occupied on the principal tributaries, and continuous records obtained from the dates of establishment.

These gauges are: Paducah, on the Ohio, June, 1884; Wittsburg, on the Saint Francis, June, 1884; Clarendon, on the White, July, 1884; Yazoo City, on the Yazoo, July, 1884.

The Commission now maintains twenty gauges on the Mississippi and tributaries. Since the inauguration of the present inspection service, mentioned in the last report, the breaks in the records of these gauges have been few and brief.

The miscellaneous work performed in connection with the gauge inspection is detailed in the report of the secretary of the Commission.

The only violent change in the regimen of the river has been a cut-off, which occurred about May 10, 1884, through a narrow neck nearly midway between Vicksburg and Natchez. The channel was shortened about 12 miles. A survey was obtained within a few days after the event, and two have been made since. It is proposed to continue these examinations at, above, and below the cut-off, to determine as far as possible its immediate and ultimate effects upon the channel in its vicinity.

Precise levels.—No field work has been done during the year. The final reduction of the portion of the line between the Mississippi River and Lake Michigan has been completed.

Final topography and hydrography—Has been completed from Trotter's Landing to Saint Louis Landing, 45 miles; from Plum Point to Randolph Point, 46 miles; from Donaldson's Point to Caruthersville, 50 miles; and from Grand Tower to Devil's Island, 27 miles; making a total of 168 miles surveyed during the year. The survey of the river, with marginal topography, is now complete from Cairo to the Gulf.

Detail charts (scale one ten-thousandth have been finished from Greenville to Lake Providence, and from Waterproof to Donaldsonville, covering 222.4 miles of river. The charts from Cairo to New Madrid, Caruthersville to Memphis, and Commerce to Saint Louis Landing, lack only the topographical signs.

The publication of a series of charts on the scale of 1:20000 has been decided upon and material for twenty of them and in part for thirteen more has been prepared.

Work on the preliminary chart (1 inch to a mile) has been continued. Five sheets, extending from Rodney to Donaldsonville, have been drawn, and five sheets, extending from the foot of Island 97 to Jackson's Point, published. Three sheets are now ready for the printer, and two more, completing the series, will be ready early in January; and the entire series will be in print by the first of March.

Miscellaneous.—Observations of the flood escape through crevasses

were again made at the last high water. The collection of reliable high-water marks has been continued.

Especial attention has been given this year to obtaining correct data as to the depths on bad bars at low water.

Experimental work at the discharge stations of 1882 has been reduced.

A financial statement and an authorized statement of expenditures from the appropriation act of March 3, 1883, appear below.

The following papers relating to the work of surveys and examinations are submitted as appendices to this report:

Appendix A.—Annual report of the secretary of the Commission.

Appendix B.—Final results of precise leveling from Fulton to Chicago.

Appendix C.—Reports upon the field work of topography and hydrography.

Appendix D.—Results of experimental work at discharge stations.

CONSTRUCTION.

At the date of the last annual report, December 21, 1883, operations under this head were drawing to a close, the funds in the hands of the Commission being exhausted. Owing to their apprehension of damage to unfinished work during the high-water season, then near at hand, the Commission recommended to Congress an immediate appropriation of $1,000,000 to enable the work to continue during the balance of the fiscal year. Congress acted on this suggestion, and the sum asked for was appropriated by act approved January 19, 1884. Unfortunately, the relief came too late, as the river began rising rapidly in the latter part of December and remained at a very high stage, which finally culminated in the latter part of February in a flood of about the same magnitude as those of the two preceding years. The river remained high for a long period, and but little work could be done before July. The damage done to the works was, on the whole, less than might have been anticipated. The pile-dikes sustained much less injury than had been the case in former years, due no doubt to the improved methods of construction which had been adopted, but the revetment work, much of which had been left in an incomplete state, suffered severely.

During the present season all damage has been repaired, the systems of pile-dikes have been strengthened and extended, and much revetment work of improved character has been carried on. The funds available will be about exhausted January 1, 1885, and although it is hoped and expected that by that time the season's work will be left in much better shape than heretofore, yet much more satisfactory results might have been secured had the appropriation for these works been more liberal. The caving banks within the reaches under improvement are very extensive, and the means at the disposal of the Commission have not hitherto been adequate to complete their protection. The caving of these banks has given serious trouble, necessitated many changes of plan, and in some instances has jeopardized the whole system of contraction works put in to control and deepen the navigation channel. This danger will continue till these banks are secured, which will require considerable expenditure and should be completed in one season if possible.

The marked improvement of low-water depth where works are being carried on, alluded to in last year's report, was again exemplified at the recent low water. Wherever the contraction works had been even approximately completed the depths were nearly double those found on the

unimproved portions of the river in their vicinity. It seems as if this fact should settle all doubts as to the possibility of so improving the navigation of the river by the methods adopted by the Commission as to meet any reasonable requirement. The minor difficulties incident to the inception of any new work are fast disappearing as experience is acquired, and all that now seems necessary to make the work successful is that funds shall be supplied liberally and promptly.

During the low-water season of 1883 not more than 6 feet of water was found through the New Madrid and Memphis reaches, which lie, respectively, above and below that of Plum Point. The case this year was but little better. It would seem, therefore, advisable to extend the work to these reaches as soon as possible, as such a course would open to an improved navigation about 250 miles of river from Cairo down, or about one-fourth of the distance to New Orleans, and nearly one-half the total distance which requires extensive improvement. That such a result would be of great value to navigation cannot be doubted. The Commission have prepared plans for beginning work on these reaches, and will take them in hand as soon as the funds placed at their disposal will justify such action. They also deem it essential to the success of the work already done, and a necessary part of their plan of improvement, that the revetment of banks which are caving with sufficient rapidity to endanger or embarrass navigation, should be at once undertaken and carried forward systematically beginning at Cairo and progressing down-stream, precedence in time being given to those places where the caving is most rapid or injurious. Throughout the portions of river lying between the reaches of bad navigation are found many long stretches where navigation is now good, and which only need work of this character to keep it so, while at other points shoals exist which would probably disappear or become less troublesome if the banks were held and the river allowed to contract and deepen by natural agencies. The fixation of the channel is of the utmost importance in the plan of improvement contemplated by the Commission, as otherwise changes may occur from the caving of the banks which will destroy or render useless costly works of improvement, and, by causing fresh shoals where navigation is now good, render an indefinite extension of the work necessary. This work is conservative in its nature, and cannot supersede the work already begun or projected for the shoal portions of the river; but it is an important adjunct, and, as much time will be required for its execution, there should be no delay in beginning it. The Commission have provided for initiating this work between Cairo and Memphis in the estimate which accompanies this report.

By the terms of the last river and harbor act the Commission were directed to take charge of the improvement of the Mississippi River between the mouth of the Ohio and the Des Moines Rapids, upon which work has for many years been in progress under the Engineer Department, U. S. A. Projects for the season's operations were prepared by the officers in charge of the works, and, having received the approval of the Commission, are now in process of execution. Estimates for continuing these works are submitted.

The names of a large number of harbors were inserted in the river and harbor bill, with a view to their improvement; but as the amount appropriated was far short of the estimates of the Commission, they did not feel justified in taking up this work except at Memphis, where the act specified the amount to be expended, and at Vicksburg, where repairs were needed to work already done. The Commission have, how-

ever, prepared separate estimates for such work at these places as seems necessary to accomplish the objects proposed, and these estimates are submitted to Congress for such action as they may deem proper, it being the desire of the Commission, if Congress decides that any or all of this work be undertaken, that they will specify the localities and the amount to be expended at each.

WORKS ABOVE CAIRO.

(Des Moines Rapids to mouth Illinois River, 161 miles in length. Officer in charge, Maj. A. Mackenzie, Corps of Engineers, U. S. A., to September 1, 1884. Since that date, Capt. E. H. Ruffner, Corps of Engineers, U. S. A.)

HEADQUARTERS, QUINCY, ILL.

The general plan upon which work in this district is in progress consists in closing all side channels by low dams, usually of brush and stone; in contracting the width of the river, where excessive, by spur dikes of similar construction to the dams, and in protecting by brush mattresses covered with stone such banks as are subject to erosion. The object sought is to contract the low-water channel to a uniform width and thereby increase its depth to about 5 feet at low water. This work has been in progress for several years and the results have been good.

Since this work came under the direction of the Commission, the dams opposite Quincy have been raised and repaired; the shore of Buffalo Island, below the Louisiana Bridge, has been revetted and the dam opposite the foot of the island has been repaired. At the dam between Brockaw Island and the Illinois shore the foundation for the dam has been laid; the shore protection and the dam itself are in progress. An experimental dam composed of piles and sheet piling has been built between the Illinois shore and Island No. 421, opposite La Grange, Mo. There is also in progress a wing-dam half way between Canton and La Grange, shore protection at Bolter's Island, and a dam from this island to the adjacent tow-head. A contract has also been made for dredging Quincy Bay. All of this work has been much delayed and impeded by the high stage of water which has prevailed during the fall season.

Work must soon close on the advent of cold weather, but will be resumed in the spring and prosecuted to the extent of the available funds.

For details of work in this district see Report of Capt. E. H. Ruffner, Corps of Engineers, U. S. A., Appendix K.

(Mouth of Illinois to mouth of the Ohio, 241 miles in length. Officer in charge, Maj. O. H. Ernst, Corps of Engineers, U. S. A.)

HEADQUARTERS, SAINT LOUIS, MO.

In this district also the work has been in progress for several years, under the Engineer Department, U. S. A.

Above the city of Saint Louis, the only point where work is now in progress is at Alton Harbor, where a dike, built in former years to improve the depth of water at the landing, is being repaired and raised to a uniform grade of 14 feet above low water. On October 1, 1,680 feet had been finished, and the balance was well advanced, though work had been stopped by high water. It is expected that the work will be completed in the spring.

Below Saint Louis begins the general work of improvement ultimately intended to extend out to Cairo. The general plan of this work is similar to that adopted by the Commission for the Lower River, and the methods employed are also similar. The plan consists essentially in narrowing the river to an approximately uniform width of 2,500 feet,

by building up new banks and reclaiming portions of the river bed by various silt-arresting devices. All banks exposed to erosion are to be protected by mattress revetment covered with stone. The plan thus outlined contemplates an ultimate improvement in channel depth that will give 8 feet between Cairo and Saint Louis at low water, and has been perfectly successful so far as carried out.

Since this work passed under the charge of the Commission, but little has been accomplished, owing to the late date at which the necessary preparations were completed. It will be pushed henceforth as rapidly as possible.

At *Arsenal Island*, the head of the island and the west side have been revetted for a distance of 1,283 feet. This work secures a stone revetment, previously placed there to protect the upper bank. The new work extends 300 feet above the head of the old work, and the upper bank over this extension has been riprapped, as also 100 feet on the east side of the island.

At *Horsetail*, on the west side, the shore protection of stone has been raised from 6 feet to 21 feet above low water for a length of 1,150 feet. On the Illinois side two new hurdles, Nos. 27½ and 29½, have been extended an aggregate length of 1,415 feet, and nearly completed, while another new hurdle, No. 31, has been begun. There was not less than 9 feet over this bar at the last low water.

At *Twin Hollows*, on the west side, repairs to the primary hurdle and to secondary hurdles Nos. 1, 4, and 5 were begun and partly completed. This work has given very good results, there having been not less than 9 feet in the channel at low water this season. The works require further extension, which can now be undertaken. At *Twin Hollows*, on the east side, the revetment of the Illinois shore is being extended. The mattress will be 120 feet wide from low-water mark and extend 990 feet along the bank.

At *Pulltight* the wattling of hurdle No. 5 has been completed, and hurdle No. 4, 1,770 feet long, has been begun and partly finished.

At *Jim Smith's* work has been confined to the reconstruction of the old hurdles and to putting new ones in the intervals. In all there are 9 hurdles, which are well advanced. The least depth at this point was 7½ feet.

At *Cairo*, according to the requirements of the river and harbor bill, a revetment is being constructed back of the town. By the terms of the act this is to extend down-stream from the lower end of the revetment constructed in former years by the Government, and $50,000 is allotted for the purpose. This work is now in progress. The mattress revetment, 120 feet wide, extends around and between the stone dikes put in by the Cairo Land Company, and will be continued down-stream as far as the funds allotted will allow.

For details of work in this district, see report of Maj. O. H. Ernst, Corps of Engineers, U. S. A., Appendix L.

WORKS BELOW CAIRO.

FIRST DISTRICT.

(Cairo to foot of Island No. 40, 220 miles in length. Officer in charge, Capt. J. G. D. Knight, Corps of Engineers, U. S. A.)

HEADQUARTERS, CAIRO, ILL.

This district includes the New Madrid Reach, extending from the head of Island No. 8, 42 miles below Cairo, to the foot of Island No. 14,

a distance of 60 miles; the Plum Point Reach, extending from the head of Island No. 26, 147 miles below Cairo, to the head of Island No. 35, a distance of 40 miles, and the harbors of Columbus and Hickman, Ky

NEW MADRID REACH.

No work has been done on this reach beyond preparing a plan for its improvement, which it is hoped may be soon put in execution, as the shoals have given much trouble during the last two low-water seasons.

PLUM POINT REACH.

No modification has been made in the general project as described in our last annual report, and work during the season has been in continuation of that project.

The revetment at Ashport, Tenn., has not been extended during the season; the old work is still intact.

The system of contraction works at Gold Dust Point, designed to close the chutes behind Elmot Bar and Island No. 30, were not entirely completed at the date of last report, and when the high water occurred there were gaps in the main dike and all the cross-dikes except the lower one, No. 5. Through these gaps the rising river poured with great velocity, carrying masses of drift, which finally proved too heavy for dike No. 5. This dike was breached, and some of the others were more or less damaged, the main dike being broken up for a length of 400 feet. Subsequently these dikes were repaired and strengthened. Those gaps which could not be closed were mattressed to prevent scour, and the whole system has been prepared, as well as possible, to resist the attacks of another flood. The deposit obtained by this system of dikes has been very great, some 3,000,000 cubic yards in all. In many places this fill extends 30 feet above low water, and recent surveys show that at low water the chute below dike No. 5 would be dry.

Opposite to the Gold Dust dikes the right bank, from Mill Bayou to Elmot's Landing, is caving badly. A revetment, 175 feet wide, for its protection, has been begun at Fletcher's Field, and a length of 4,930 feet has been built, besides 800 feet of revetment of less width. The upper bank has been graded and revetted for a length of 2,000 feet. Some difficulty has been met with here from seepage water from the bank, which has a tendency to wash down the upper portion of the revetment.

Of the system of works designed to close Osceola Chute, and to hold the tow-head, dikes Nos. 1 and 2 are in good condition. Behind No. 1 the chute is now dry at a 10-foot stage, and a growth of willows has started over a large portion of the old river-bed. A gap in dike No. 3 has been closed and general repairs made. This dike is now in good condition. The revetment on the upper tow-head, destroyed in 1882 and 1883, has not been replaced. On the lower tow-head there was, at date of last report, 2,663 feet of revetment 150 feet wide; the upper bank was unprotected. This work was not resumed till August, 1884, when it was found necessary to build a narrow mat, 1,337 feet long, at the head of the work, to connect the old revetment with the shore. The upper bank has now been graded and 872 feet revetted with brush. It is expected to complete this work, as far as the sub-aqueous mat extends, before operations close this winter. Osceola dike, No. 4, has been built this season. It was finally located below the foot of Osceola Bar to check a tendency to cut through into Bullerton Chute. This ob-

ject was successfully accomplished, though much difficulty was experienced in the construction of the dike, which is 2,450 feet long. During the time it was building, the Arkansas shore caved badly and the channel deepened to 50 feet; an offset in the dike was needed to pass this deep place. Since its completion large masses of drift have accumulated above the dike and a heavy fill has taken place in its neighborhood; this amounts to 15 feet in depth 100 feet below the dike.

At Bullerton Tow-head at date of the last annual report the revetment of the river side lacked 500 feet of mattress, 2,700 feet of upper-bank protection, and much stone. This work has since been completed, and all weak places repaired. There have been several slides, due to deep water returning to the river, and attempts are being made to prevent this action by the construction of broken-stone drains to collect and carry off this water. The low-water channel having finally left Bullerton Chute, dike No. 1, across this chute, is about to be closed, and No. 2 dike has been begun. Both these dikes will be completed before the season closes.

The dikes under Plum Point, designed to contract the channel between Bullerton Tow-head and Yankee Bar, have been extended 11,565 feet during the year, and now aggregate 15,010 feet in length; 1,000 feet more in length is required to complete the portion now authorized, after which no further extension will be made till all danger is over of the channel returning to Bullerton Chute.

At Craighead Point the revetment of the right bank has been begun, but not much progress made; 1,100 feet of mattress has been sunk just below the foot of Bullerton Tow-head. Its construction was attended with much difficulty, owing to the strength of the current encountered.

During the low water of this season there were five channels through Bullerton Bar, two of which led into Bullerton Chute, and were cut off by the construction of Osceola Dike, No. 4, and the dikes in the chute itself; one channel ran along Plum Point and Yankee Bar, and was cut off by the extension of the Plum Point dikes; the other two were located, one against the river side of Bullerton Tow-head; the other in the middle of the river. Much trouble was experienced at first from this great dispersion of the water, but as the contraction works were advanced and began to act, the Bullerton Tow-head Channel finally became the main one and gave 12 feet of water at the lowest stage reached. More or less trouble must be expected at this place till the contraction works can receive their full development and have time to act. The effect exerted by them in their present incomplete state leaves no doubt, however, as to the ultimate success of the work.

Much revetment work remains to be done on this reach, both between Ashport and Craighead Point, and also in the vicinity of Island No. 26, where serious changes are threatened. The dike work is nearly completed, and will mainly need watching and repair.

COLUMBUS, KY.

This is one of the harbors named in the river and harbor bill. The trouble here lies in the caving of the bank in front of the town. It is thought that the protection of 3,000 feet of bank will be required, which, at $20 per foot, will cost $60,000. To this must be added $20,000 for plant, making a total estimate of $80,000.

HICKMAN, KY.

This harbor is also named in the river and harbor bill, and the trouble is the same as at Columbus, Ky. It is thought that 12,000 feet of bank

will require protection, which, at $20 a foot, will cost $240,000. To this must be added $30,000 for plant; making a total estimate of $270,000.

For details of work in this district, see report of Capt. J. G. D. Knight, Corps of Engineers, U. S. A., Appendix F.

SECOND DISTRICT.

(Foot of Island No. 40 to mouth of White River, 180 miles in length. Officer in charge, Maj. A. M. Miller, Corps of Engineers, U. S. A., till September 1, 1884; since that date, Capt. C. B. Sears, Corps of Engineers, U. S. A., temporarily.)

HEADQUARTERS, MEMPHIS, TENN.

In this district are included the Memphis and Helena reaches, the first extending from the foot of Island No. 40, 220 miles from Cairo, to Scanlan's Landing, a distance of 27 miles, and the second extending from Commerce Cut-off, 270 miles from Cairo to Friar's Point, Mississippi, a distance of 55 miles.

The first reach embraces Memphis Harbor.

MEMPHIS HARBOR.

The revetment in front of the city, which has been built at various periods since 1878, and which has heretofore given much satisfaction, gave way during the flood of 1884 at several points, and caused the destruction of much valuable property. Much alarm was felt in the city, and Congress directed the expenditure of $200,000 in renewing the protection. Surveys have shown that the trouble was due to the caving in of Hopefield Bend, and the great growth of the bar opposite the town, upwards of 750 feet in two years. Both these influences combined to push the deep water against the town front and to cause a severe scour of the river bed. This undermined the revetment and caused its failure. As soon as possible orders were given to start the work, using mattresses 300 feet wide instead of 120 feet, the width of the old ones. The first attempt to sink these wide mattresses failed, the mattresses pulling to pieces under the heavy strain; later reports, however, indicate success. Meanwhile a narrow mattress, 150 feet wide, has been carried from a point 500 feet above Wolf River, across that stream and along the city front, a total distance of 3,925 feet. The wide mattress will be laid on top of this narrow one. The upper bank is being graded and covered with stone.

This revetment must be carried along the whole city front to insure its safety, and an estimate of $75,000 for its completion accompanies this report.

MEMPHIS REACH.

Work on the reach has been confined to the revetment of Hopefield Bend, immediately above the city of Memphis. At the date of our last report 6,700 feet of mattress was down, and 4,100 feet of upper bank protection completed. Before the high water set in this had been increased to 10,400 feet of mattress, made and sunk, and 5,700 feet of upper bank protection. The mattresses were 140 feet wide. During the flood the bank caved badly, where the upper bank had not been secured, and this portion of the revetment was lost. The remainder sustained some damage from the seepage of water from the bank after the subsidence of the flood. It is hoped to repair and complete this work during the coming season.

Plans have been prepared for the improvement of this reach, which the Commission desire to undertake as soon as funds will allow, the bars in the immediate neighborhood of Memphis having been very troublesome both in 1883 and 1884.

HELENA REACH.

No work has been done on this reach during the season.

For details of work in this district see report of Capt. C. B. Sears, Corps of Engineers, U. S. A., Appendix G.

THIRD DISTRICT.

(Mouth of White River to Warrenton, 220 miles in length. Officer in charge, Capt. W. L. Marshall, Corps of Engineers, U. S. A., to April 21, 1884; since that date, Capt. C. B. Sears, Corps of Engineers, U. S. A.)

HEADQUARTERS, MEMPHIS, TENN.

In this district are included the Choctaw Reach, extending from Cork's Point, Arkansas, 422 miles below Cairo, to Arkansas City, Ark., a distance of 31 miles; the Lake Providence Reach, extending from Carolina Landing, 530 miles below Cairo, to the foot of Island No. 95, a distance of 35 miles, and the improvement of the harbors of Greenville and Vicksburg, Miss.

CHOCTAW REACH.

No work has been done on this reach during the season.

LAKE PROVIDENCE REACH.

The work on this reach during the past year has been in continuation of that outlined in our last report, the only new work being the cottonwood system of dikes.

In Louisiana Bend two detached pieces of revetment, the upper 1,600 feet and the lower 2,000 feet long, had been built at the date of our last report. Of these, the upper piece is safe, the lower one was flanked by the river, and now lies on the bottom. The work has been vigorously pushed this fall, 14,000 feet having been completed, including the grading and protection of the upper bank. The holding of this bank is of the greatest importance, as its recession throws the whole force of the current against the Duncansby system of dikes on the opposite side of the river. The river is still encroaching on these works, and will continue to do so until the caving above is stopped.

Work on the Duncansby system has been confined to repairs of dikes that had been damaged during the flood, and to the completion of the dike on range No. 36.

So far, these works, which are designed to keep the river out of Skipwith's Chute, have successfully accomplished this object, and the silting up of the chute is steadily progressing.

In the Mayersville system the cottonwood system of dikes has been built this season. They were designed to close a channel which was developing along the Louisiana shore, near Cottonwood Point. This object has been successfully accomplished, and the dikes are in good order. Their total length is 8,527 feet.

In Mayersville chute the heavy five-row cross-dike was breached for a length of 125 feet by the pressure of drift. This gap has been closed and more cross-dikes are being constructed farther down the chute.

The caving of the Mississippi shore above the head of the chute and the general movement of the deep water towards Mayersville Island, has caused the destruction of most of the longitudinal dike across the head of the chute. This, however, is not of much importance, as the dikes in the chute are sufficient for the purpose intended.

The revetment on the outside of Mayersville Island has been kept up, though with much difficulty on account of the sandy character of the soil. It will have to be held by constant work till the river outside has adjusted itself to the new conditions.

The Baleshed system of dikes is in good order and has given excellent results. Foot-mats were put in at the head of the system last winter, and a high dike has been constructed behind the original low longitudinal dike, between cross-dikes 1 and 6. Repairs have also been made to cross-dikes 3 and 4, and to the main dike below No. 6. Two or more additional cross-dikes are required in Baleshed chute to break up the fall, which is now excessive. A cross-dike 2,000 feet long has been built above Stock Island, and the main dike, from this cross-dike to the head of the island, has been strengthened. Very great deposits have been induced by this system of dikes, and the head of the work is now dry at a half stage.

The Hopwell system of dikes has not required attention during the year.

The excellent low-water depths reported last year throughout this reach prevailed again during the recent low water; 15 feet was the least depth found on the reach, which was 6 or 7 feet more than was available for 40 miles above or below.

VICKSBURG HARBOR.

No work was done during the year on the inner harbor and none is proposed. Recent surveys show that no changes of importance have occurred.

At Delta Point, on the opposite side of the river, the revetment has required repairs, and has been extended down-stream 800 feet. The Commission are of opinion that further repairs and extension will be required, and submit an estimate of $20,000 for this work.

GREENVILLE HARBOR.

A survey of this locality has been made. The trouble lies in the rapid caving of the river bank in front of the town. For its protection $136,000 will be required, in addition to the necessary plant, which will cost $50,000, making a total estimate of $186,000.

For details of work in this district, see report of Capt. C. B. Sears, Corps of Engineers, U. S. A., Appendix H.

FOURTH DISTRICT.

(Warrenton, Miss., to head of passes; 484 miles in length. Officer in charge, Maj. Amos Stickney, Corps of Engineers, U. S. A.)

HEADQUARTERS, NEW ORLEANS, LA.

This district embraces the improvement of the harbor of Natchez and Vidalia; the deflection of the waters of Red River from the Atchafalaya, and keeping open a navigable channel through the mouth of the Red River into the Mississippi River; a lock at Bayou Plaquemine, and the improvement of New Orleans Harbor.

NATCHEZ AND VIDALIA.

A recent survey of this locality shows that the caving, in Giles and Marengo Bends, still continues but that it is most rapid and dangerous at Palo Alto Point, just above Vidalia. In all 55,000 feet of bank requires protection. Major Stickney, in his report (Appendix I), proposes to begin the protection at Palo Alto Point, using submerged spurs, such as are now being tried at New Orleans, and should the method be successful he proposes to extend it so as to cover the whole caving bank. The estimate for the work, on this basis, is $600,000, to which must be added $100,000 for a levee along Caro Pen Point, designed to stop the flow of water across this neck in time of flood, which now seriously threatens the formation of a cut-off. The total estimate therefor, according to the plan proposed, is $700,000. If the spurs should not prove successful and mattress revetment be required, the cost would be at least double.

DEFLECTION OF THE WATERS OF RED RIVER FROM THE ATCHAFALAYA, AND KEEPING OPEN A NAVIGABLE CHANNEL THROUGH THE MOUTH OF THE RED RIVER TO THE MISSISSIPPI.

Under the recommendations made in the last annual report, and allotment made by the Commission from the annual appropriation, at the approach of low water operations with dredge-boats were renewed in Old River, with the view of keeping open navigation from the Red to the Mississippi River. The details of the work and the success attending it are fully described in the report of Maj. A. Stickney, Corps of Engineers, U. S. A. (Appendix I), to which reference is made.

During the execution of such permanent plan as may be adopted for the improvement of this vicinity, it may be annually necessary to resort to this temporary method of relief to navigation. The subject of permanent treatment is discussed elsewhere in this report.

NEW ORLEANS HARBOR.

At date of last report a mattress 400 feet in width was being laid in Carrolton Bend. Owing to delays in receiving material the rising river forced a suspension of operations, when 470 feet of this mat had been completed and sunk, and the work has not been resumed, owing to the more pressing necessity of protecting the bank in Gouldsborough Bend. Here the protection will consist of a series of sloping, submerged spurs, so designed and located as to move the current of the river away from the bank to be protected. These spurs rest on a mattress 200 feet wide and 350 feet long, laid on the bed of the river and normal to the bank, beginning at low-water mark. The spurs themselves are built up of timber cribs, filled with brush and loaded with stone. The width of the structure at the bottom is 60 feet, which diminishes by steps to 20 feet at the top, the size and arrangement of the cribs being such that the top of the finished structure will have a slope of 1 vertical to 3 horizontal from low-water mark to the bed of the river. The distance apart of the spurs will vary from 500 to 1,600 feet, according to the curvature of the banks. One spur is now well under way, and two more will probably be nearly completed with the funds now available.

The work is experimental, and its efficiency can only be determined after the subsidence of the next flood. The estimate for continuing this work and for completing the revetment in Carrollton Bend is $683,600.

For details of work in this district, see report of Maj. Amos Stickney, Corps of Engineers, U. S. A., Appendix I.

PLANT AND GENERAL SERVICE.

Plant in use in the several districts and in the general service during the time covered by this report:

Owned by the Government.—Two hundred and thirty-six barges, of which 30 were borrowed from the Missouri River Improvement; 47 quarter boats, 21 mattress boats and ways, 84 pile-drivers and hulls, 7 dredges and hydraulic graders, 6 dump boats, 3 derrick-boats, 2 pumping-boats, 8 screen boats, 9 docks, store and wharf boats, 5 machine and carpenter boats, 23 small flats and shells, 137 yawls and skiffs, 5 steam launches and tugs, 13 steam tow-boats, and quarter and stops at depots on shore.

The estimated value of the above September 30, 1884, was $1,276,000.

Chartered.—Fifty barges and 8 steam tow-boats and launches; the estimated value of which is $328,000.

The estimated value of the whole plant in use during the year is $1,604,000.

The general service of purchase, supply, and towing for the districts and the construction of plant was in charge of Capt. C. B. Sears, Corps of Engineers, secretary of the committee on construction, from November 1, 1883, to April 10, 1884, when he was transferred to the charge of the third district, is presented by his successor, Capt. J. H. Willard, Corps of Engineers, to which reference may be made for details. (See Appendix E.)

Levee construction.—Under the allotment of $200,000 from the last annual appropriation the repairs of levees in the second, third, and fourth districts were continued. All information concerning this work is detailed in the reports of the executive officers of the above districts (appendices G, H, and I), and in the report of the board of district officers (Appendix M), to all of which reference is made.

LEVEES AND OUTLETS.

The difficulties of navigation on the Mississippi River below the mouth of the Missouri at no time arise from want of volume.

During the flood stages the supply is, of course, ample; and it is equally true that if the volume of discharge of even the lowest stages were constant, it would develop, in time, a sufficient channel for navigation.

Where the increases of width and area of section have become so excessive as to have seriously impaired navigation, scour and fill are less the result of absolute velocity than of the relative velocities in adjacent sections. In such cases the narrow and deep parts have greater areas of section, and therefore lesser velocities in the lower stages; while the wider and bar-obstructed sections at that period have lesser areas and greater velocities. At higher stages this relation is reversed.

An increment to the bars accompanies the flood because in the sections where they form there is greater area and less velocity than in the pool sections above. This subject is discussed by Mr. R. E. McMath (Report Mississippi River Commission, 1881, Appendix K, p. 242).

This condition is not a necessary result of the flood in a regulated river, but rather of those irregularities of the water-way, the correction of which constitutes an essential part of the plan of improvement projected by the Commission. With equal widths there should be no such interchanges of velocity at adjacent sections in high and low stages, and no differences of depth and area except at reversion points, where less

resistance makes lesser sectional dimensions equally efficient. A certain result of such uniformity of the elements of area as has always been insisted on by the Commission will be the correction of this local bar building by the flood.

To this bar growth at high stages there is a logical limit. When it has progressed far enough to maintain, by contraction, the velocity of approach from above, it necessarily ceases. This is true as long as the volume of discharge finds no other means of escape outside the bed of the stream. But when such opportunity is afforded, the bar growth is unchecked as long as a line of less resistance is open through the outlet. In the case of a cut-off the entire river is deflected in the direction of the increased slope, through the new bed, and within a year or two the abandoned channel is entirely closed.

Now, "when we consider that the slope of the river along its proper course averages scarcely one-third foot to the mile, while the banks slope away from the river 4 to 10 feet to the mile, it is easy to see to what an extent, during floods, the river is tempted to change its course," and that in such proportion as this temptation prevails, an effect similar to that of a cut-off in building a bar across the depleted channel is produced.

As the direction of the surface slope affects the direction of the thread of motion of the stream to all depths, so in case of both cut-off and crevasse the stream is turned, involving a loss of power in the impact against the bank; continuity of motion is broken, velocity is reduced, and a source of bar-formation is introduced. In the case of the crevasse, by the loss of volume, loss of velocity and ultimately of section is also incurred.

All plans proposed for the improvement of the river have for a common aim the establishment of uniform conditions at the same stages. As these conditions are interdependent, the securing of any one will tend to bring about the others. Thus uniform section will give uniform mean velocity, which in turn will induce greater uniformity of channel depth at any given stage. But, as an element of uniform section, the importance of uniform width by itself as a factor in producing uniform velocity is lessened so long as the escape of water from and return to the river, over banks varying 20 feet in height, as referred to the flood slope, allow inequality of flood velocity and depth as great as results from the present unequal widths.

Variation of discharge, at the same flood stage, in alternating parts of the river, from 1,000,000 to 1,600,000 cubic feet per second is as much an obstacle to stability of regimen as the existing difference of width; and improvement is only attainable by the control of both the area and discharge.

Uniformity of bank grade, therefore, as an element of uniformity of section and velocity and channel depths, assumes the same importance as uniformity of width, and should be extended and maintained over the entire length of the alluvial river.

The present grade of the banks with reference to its earlier and normal conditions is discussed in Appendix F, page 122, Report Mississippi River Commission, 1881. The levees as heretofore built, or as now recommended, cannot justly be considered as superimposed on, or added to, what would have been the bank height when carried unchecked to its natural limit; but as establishing, by artificial means, a grade which the river in the free exercise of its functions is ever seeking to attain, and to which, under normal conditions, it has approximated.

All observations bearing on this subject made by the Commission

sustain these views. In 1862 a break known as "Cubitt's Gap" occurred in the left bank of the river, about 4 miles above the head of the Passes. It rapidly enlarged until its section was about 34 per cent. that of the main river. The locality was surveyed in 1868, 1872, 1875, 1876, and 1877 by the United States Coast and Geodetic Survey. So we have a full physical history of the changes, which are thus stated by Mr. Marinden, assistant in charge of the surveys:

A noticeable feature in front of the "gap" and one which in a great measure must be traced to it as its cause, is the formation of a flat on the west bank as shown by the deep contours—the 24-foot curve more especially. Starting at a point on the west shore, 3,000 feet above the "gap," where all the curves run parallel to the shore, and the 24-foot curve is 260 feet from the 3-foot curve, which I have taken as the reference for convenience, being smoother than the shore-line, although running parallel to it, the 24-foot contour abruptly juts out towards the center of the river, till opposite the north point of the "gap" it is 820 feet from the 3-foot curve; then following down-stream and opposite the south point it is 920 feet; then after passing the opening of Cubitt's Gap it retreats toward the shore-line, so that about 2,000 feet below the south point it is 760 feet; 4,000 feet below it is 720 feet off, and 8,000 feet below the "gap" it is only 500 feet off, notwithstanding the gradual expansion of the Mississippi, which at the upper limit is 3,720 feet wide, and at the lower limit, 8,000 feet below the "gap," it is 4,815 feet in width, as measured between the 3-foot curve of each bank.

From the south point for a distance of about 1,300 feet down-stream, the two surveys compared are one of 1866, and the other 1876, which give a mean shoaling of 1.6 feet in the ten years, or 0.16 foot per year.

From the above-mentioned limit, 1,306 feet below the south point of "gap" to Cubitt's House, we have two surveys for comparison, one executed in 1866 by Assistant Gerdes, and the other by my party in 1877, giving an interval of eleven years; over this space there has been a mean shoaling of 3.9 feet, or 0.35 foot per year.

From Cubitt's House to the Head of the Passes, including all the space now covered by the works for the improvement of the channel-way into South Pass, we have two surveys again; one of 1866 by Assistant Gerdes, and one done under my direction in 1875 by Subassistant Braid. These surveys show a decrease in depth of 3.6 feet in nine years, or 0.4 foot each year. Where, however, the present jettied channel into South Pass is located there has been a decided deepening.

A subsequent survey, under the direction of the Commission, indicates the continued progress of this deterioration of the channel, which already threatens serious consequences to the maritime commerce of New Orleans.

The great loss of section, extending many miles below Malone's, Riverton, Bolivar, and Mound Place, and consequent upon these crevasses in 1882; and also the enlargement of the low-water section below Bonnet Carré, caused by the closing of this crevasse in the same year, were fully described in the last annual report of the Commission (1883, p. 16, and Appendix D, part 4, p. 171).

That such results are not only local but cumulative—throughout long reaches—is also indicated by observations. The guage records of flood heights, and the knowledge of facts connected with them, are not extended or complete enough to possess full authority. But if Memphis and Natchez are respectively selected as locations characteristic of unleveed and leveed fronts, and the existing record at each point divided into two parts covering equal time periods, and the means compared, it shows that the floods along the unleveed fronts have become greater during the latter half of the time covered by the record, while for the same relative time along leveed fronts they have been less. As there is no doubt of the increase, during this time, of one factor of sectional area—width—any tendency to greater flood heights along unleveed fronts means a more than proportionate decrease of the depth. The reverse of this is the apparent inference along the leveed front.

These two points, Memphis and Natchez, have been selected as fairly representative, having the longest records (57 and 82 years, respectively),

and being least affected by conditions not under consideration. An examination of the adjacent gauge records does not conflict with the inference drawn from those cited.

Again, the greater oscillation between high and low water at the mouth of the tributaries than at intermediate points has long been observed. It is presented here in tabulated form for the gauge stations at the mouths, and one intermediately located. It is represented graphically for all gauge stations in Plate No. 1.

Location.	Extreme.	Mean of last five years.
Cairo, mouth of Ohio	53. 17	43. 48
Fulton, intermediate	34. 55	30. 13
Helena, mouth of Saint Francis	47. 20	38. 57
Malone's, intermediate	34 05	33. 91
Mouth White River	48. 40	40. 06
Lake Providence, intermediate	40. 90	32. 91
Vicksburg, mouth of Yazoo	51. 10	39. 85
Natchez, intermediate	50. 30	38. 04
Mouth Red River	48. 50	39. 39

These differences of relative level have generally been attributed to abnormal local flood elevations, caused by increase of volume at the mouths of the tributaries. The reverse of this is the truth. The difference is in the extreme fall and not in the extreme rise at these points. The bed of the river has adjusted itself to the annually recurring demands of the discharge by increasing its depth where they are greatest, and diminishing it where the discharge is dissipated by successive outlets.

It will be noted that, while by far the greater part of this difference of oscillation is in the depression of low water, yet there is some trace of abnormal flood-height. As the average considered includes three of the greatest floods on record, this would partially disappear were the term of years extended.

As the low water surface closely conforms to the controlling bars, it seems obvious that any such general elevation or convexity of bed as is found between the tributaries must make these bars more prominent and obstructive to navigation. Between the Yazoo and the Red rivers where levees have been comparatively well maintained, giving uniformity of bank height and discharge, this irregularity of low-water slope does not recur, and the navigation is three or four feet better.

Since such levees as have been built have never restrained the higher floods in safety, it cannot be expected that the "closing of existing gaps" will suffice to restrain volumes greater than those which have heretofore overwhelmed them; or to fairly test the principles upon which the recommendation of levees by the Commission is based. They must be higher, stronger, and more continuous than they have heretofore been built.

The grade of levees for the improvement of navigation should be at least the normal height of the bank of the river, or the height to which the bank would be built by such floods as recur with sufficient frequency to exert an appreciable influence in bank building or enlargement of water-way. This grade is approximately indicated by points on or near the margin of the river, well above general overflow, where deposit has been carried to a natural limit, unchecked by swift currents, and undisturbed by caving. This grade should be supplemented by

such additional height as will protect it against frequent injury or destruction.

Preparations must also be made in the grade for such increase of flood elevation as will at first and during the period of readjustment ensue from the introduction of greater volume between levees, when made more continuous. It is not possible to predict at present to what this will amount, and it is probable that an exact conclusion will only be reached by experience.

There are variables entering into the problem so subtle as to require additional investigation and study. This is now being given. Numerous observed facts indicate that guage heights for great discharge cannot be predicted by extending the curves constructed at low and medium stages with these elements as co-ordinates.

Many of the discharge curves of the observations of 1881–'82 and other years show great irregularities in this respect.

The high-water curve plotted on Plate I is of remarkable symmetry, while the breaks in the low-water curve, to which the profile of the bed conforms, are greater and more abrupt. The imprint of the flood's power is on the bottom and not on the surface. The slope has proved more inflexible than the bed. The capacity of the river has increased as the discharge.

This indicates that increment of volume will not be piled on top of the present flood heights, and that flood slopes cannot be changed over long distances from .25 to .75 per cent. The material of the bed does not possess stability under the frictional resistance which such increased slopes would indicate. Indeed, the impossibility of maintaining a slope greater than the average is indicated in the promptness with which slope is readjusted at every cut-off, where within a few hours the process of distribution is evident for very long distances, both above and below.

It is believed, to the contrary, that if an increase of .50 to .75 of the discharge can be arbitrarily and repeatedly withdrawn from and reinjected into the bed with very slight slope disturbance, it can be retained throughout the entire course of the river, and that even the maximum present discharge, by careful and judicious engineering, can be yet further safely increased, without ultimately raising the flood plane.

The following tabulated extract from Plate No. I compares high and low water slopes between the tributaries and a single intermediate station:

Location.	Slopes per mile.	
	High water.	*Low water.*
Cairo to Fulton	.435	.360
Fulton to Helena	.426	.490
Helena to Malone's	.400	.302
Malone's to White River	.327	.490
White River to Lake Providence	.327	.278
Lake Providence to Vicksburg	.276	.398
Vicksburg to Natchez	.291	.277
Natchez to Red River	.194	.218

It is assumed that no argument is here needed to attest the practicability of a levee system. It is thoroughly established by a large experience that faithfully-constructed levees, of sufficient proportions and age enough to have settled and become sod-covered, will resist any pressure. Of 149 breaks in the Yazoo front in 1882, 147 were caused by

water running over the levees and eroding the rear slope. Caving of banks destroys far more than all other causes combined; but such loss will be reduced as caving is prevented, and permanence of bank will make the maintenance of levees of inconsiderable cost.

We therefore conclude that levees, such as have been herein described, are, in connection with an equalization of width and the prevention of caving, an important part of any general and systematic plan for the improvement of the navigation and the prevention of destructive floods; and we do recommend the construction of new and raising of existing levees along all parts of the river where the highlands are too remote to check the passage of large volumes of flood water outside the bed of the river; or, in other words, on the entire right and also on the left bank below Baton Rouge, and from the Yazoo River to Horn Lake, below Memphis.

As this recommendation extends to levees below Red River, where excellent facilities for navigation now exist, special reasons therefor seem necessary. It is not important here to repeat at length the principles on which are formed the regimen of a river so strictly alluvial as the Lower Mississippi. It has already been stated in the discussions of the Commission that the dimensions of the river are of its own creation; that a larger volume collected in one bed is discharged with less friction, other things being equal, and therefore with less slope, and more beneficent results to navigation and riparian interests; while subdivision of volume, on the contrary, meets proportionately more resistance in each minor channel, and therefore requires more slope.

It follows from this law that every step in the improvement of the river, including its delta, which begins at the junction of the Mississippi and Atchafalaya, should be in the direction of the assembling of its many outlets into one channel, while subdivision in passes or dispersion through crevasses is a grave error.

Besides these general reasons, there are others, local in character but of great importance, which will appear on examination of the physical condition of this region why the work of improvement should include this part of the river.

As has just been said, the point where the Atchafalaya diverges from the Mississippi is the true head of the delta, of which the Mississippi, Atchafalaya, and Lafourche are the only remaining passes or natural outlets. The capacity of discharge of neither of these channels is normally equal to that of the river above, just as in the subdelta neither the South or Southwest Passes or Pass à l'Outre has the capacity of the river above their joint head. But it is known that the Mississippi and Atchafalaya together cannot now discharge the volume of a great flood without disastrous overflow in the region they traverse.

Thus, in 1882, the total flood discharge from the drainage basin above the head of the delta reached 2,200,000 cubic feet per second, divided approximately as follows: Down the Mississippi, 1,450,000; through the Tensas Basin as overflow, 500,000; and down the Red and Black rivers, 250,000 cubic feet per second. Of this, 1,595,000 escaped down the Mississippi below Red River, and 281,000 down the Atchafalaya. The balance of 324,000 cubic feet per second entered neither stream, but escaped broadcast, to the Gulf, over the country.

The redistribution of a similar flood discharge, as effected by the completion of the levees above Red River, would be 1,950,000 from the Mississippi and 250,000 from the Red and Black.

Under the circumstances, one of two results is inevitable, and either would necessitate precautionary work.

In the first case the volume discharging down the Mississippi below Red River would be largely increased. This would require the temporary raising and strengthening of the levees on that part of the river. In the other case the water which now escapes in floods through crevasses in the Tensas front and returns in part to the Mississippi through Old River would reverse this movement if kept in the Mississippi, and would seek the lower levels of the Red and Atchafalaya through Old River with such force as not only to arrest the filling which now annually occurs in this channel, but also to deepen it and connect the deep water in the Mississippi with that in the Atchafalaya. This must be prevented at all hazards by work preceding the exclusion of flood water from the Tensas Basin.

These discharges of the Mississippi and Atchafalaya (respectively 1,595,000 and 281,000 cubit feet per second) are maintained for but a very short distance from the junction. Their capacity is rapidly reduced as they descend by repeated loss of volume over insufficient levees. Thus, while the Mississippi has a capacity at the gauge just below the mouth of Red River of about 1,500,000 cubic feet per second, at Carrollton, just above New Orleans, it does not exceed 1,000,000, as established by the following gaugings and computations:

	Cubic feet.
1851, Humphreys and Abbot	1,152,000
1858, Humphreys and Abbot	1,188,000
1880, Mississippi River Commission	987,000
1881, Mississippi River Commission	792,000
1882, Mississippi River Commission	921,000
1883, Mississippi River Commission	1,079,000

The surplus power of the flowing water is wasted over and through levees not sufficient in grade or strength to convert it into work. They offer less resistance than the bed of the stream. Thus, in 1884, the discharge at Red River gauge was upwards of 1,400,000, and at Carrollton about 1,000,000 cubic feet per second, while between were the following crevasses:

	Cubic feet.
Morganza	211,000
Waterloo	46,000
Bel Air	14,000
Guidry's	3,000
Davis	140,000
Total	414,000

Similar breaks occur whenever the discharge past Red River gauge largely exceeds 1,000,000 cubic feet per second. It is literally true that these levees are awash in every flood of magnitude for hundreds of miles. For long distances the waves from storms and steamboats overrun them, and a continual outflow is only prevented in many places by boards set on edge and sand-bags. It is, therefore, impossible safely to increase the slope even by a few inches in 300 miles, and without this the velocity cannot be increased nor the resistance diminished.

The mere introduction of additional volume into the upper end of a channel is not a practical compliance with the principles underlying the plan of the Commission. The condition of affairs just described has been substantially unchanged for upwards of fifty years—since the extension of levees up to Red River—and yet the volume discharged past that point, and recurring approximately with every flood, has not wrought out for itself below, in these many years, a sufficient waterway. It has run vagrant over the fields, rather than work. The re-

straint and concentration of the present supply of energy logically precedes its increase. Without this, additional volume only means waste of power and disaster from overflow.

While the enlargement of any outlet, natural or artificial, should be promptly and finally arrested, the levees from Red River down should be sufficiently raised and strengthened to restrain and apply effectively such power as resides in the mass of water now necessarily discharging and to be discharged between them before greater servitude is imposed, otherwise the treatment of the river becomes merely local, of partial measures inconsistent with a general plan and general improvement. Such a plan must protect any and all parts of the river against the direct consequences of its application to other parts by providing for the safe conduct to the Gulf of a more rapid discharge of the volume flowing from above.

Therefore, it is the opinion of the Commission that the building of levees for the improvement of navigation in the obstructed portion of the river cannot proceed indefinitely without involving damages to the proprietary interests below; and if this portion of the improvement to navigation is to proceed, provision must be made for strengthening and raising the levees in the lower portion of the river where navigation is now good.

This recommendation is not based on conditions which will be continually increasing or even permanent. No reason is apparent why the law that a larger volume of water flows through a bed adjustable by its own forces to its own needs, with less resistance and slope, should not ultimately be fully operative here.

During the transition period unquestionably the increase of work will be indicated by increase of slope, which will disappear as the equilibrium is re-established.

The following general order is believed to be judicious in the completion of a levee system. As its object is generally to enlarge the waterway, a common-sense analogy is found in the homely art of ditching. It should begin at the lower end. Each bottom, the Manchac, Lafourche, and Atchafalaya, constituting Lower Louisiana, the Tensas, Yazoo, White, and Saint Francis, should be inclosed in order, from below upwards.

In each bottom, as it is reached in the foregoing order, the most important levees, as restraining the greatest escape of water, should be first constructed.

RECTIFICATION OF RED AND ATCHAFALAYA RIVERS.

The situation at the mouth of Red River is one which has engaged the attention of the Commission from the beginning of its work. The subject has been discussed in some of its aspects in former reports, but the formulation of a complete and comprehensive plan has been deferred from time to time for the sake of the advantages to be gained by further observation, experience, and study. After full consideration of the matter the Commission is now prepared to present a plan for the treatment of this very difficult problem which is believed to meet all the requirements of the situation, and to be in point of practicability, safety, and economy the best that can be devised.

It is considered that any plan for this work ought to comprehend the prevention of the divergence of the Mississippi River into the Atchafalaya Basin, the closure of any depleting outlet at that point, either existing now or likely to be induced by changes which are reasonably

to be anticipated, and the preservation of the navigation of the Red and Atchafalaya rivers. That it shall provide for the immediate accomplishment of all these ends is not necessary, but that it shall provide contingently for them all is necessary to its completeness. It is necessary also that it shall harmonize with the conditions which will follow the exclusion of overflow from the Tensas and Atchafalaya basins.

Whether the levees necessary to prevent such overflow shall be erected by the United States or the States, or both, is not at all material. That these great areas of land will be reclaimed and occupied must be anticipated, and any wise plan for the treatment of the present situation must take that future fact into account, and not only harmonize with the conditions which will then exist, but must consist with the greatest safety of life and property in all localities liable to be affected by it. It has been the purpose of the Commission in the plan proposed to satisfy all these conditions.

For the full information of Congress on this subject it has been thought well to present in some detail, not only that plan which is recommended by the Commission, as the best one, but all that have been considered.

TOTAL DEFLECTION OF THE RED INTO THE MISSISSIPPI.

A plan fully to accomplish this object would necessarily involve the following parts:

1. A dam at or near the head of the Atchafalaya.
2. The connection of the dam with lines of level of sufficient height to restrain all floods.
3. Locks at Plaquemine and the improvement of Bayou Plaquemine and the Grand and Atchafalaya rivers.
4. Raising the levees of the Mississippi below Red River.

These constituent parts will be considered in the foregoing order.

First. The selection of a location for a dam is limited to the Atchafalaya itself—in which one would be sufficient—and to Old River, where two would be required, one above the head of the Atchafalaya, between it and the mouth of Red River, and the other below, or between the head of the Atchafalaya and the lower end of Turnbull's Island. Both of these latter dams would extend from the right bank of lower Old River to Turnbull's Island. The selection of location would be controlled by the nature of the foundation, the materials available, the safety of the completed structure, and the relative cost.

The dam, if placed in the Atchafalaya, would be about 1,000 feet long. Its maximum height would be about 100 feet. The lower half would be built below low water, in a depth of about 50 feet, and the floods would bring a head of, say, 52 feet against it. The foundation would be in clay and sand. Dams in Old River would each be about 3,000 feet long, with a net height of about 60 feet. The flood head would be the same as that against the dam in the Atchafalaya. The foundation, however, is very much worse, consisting of the recent and loose deposit with which the bed of Old River is filled to a very great depth, and it is impossible to foresee to what extent a heavy dam would sink before attaining stability.

Three materials, to be used wholly or in combination, are available—brush, earth, and stone. Since the upper side of the dam is alternately wet and dry with every change of stage, and the lower side constantly exposed to atmospheric influence, the use of brush, from its perishable nature under these conditions, is quite inadmissible above low water. Its permeable and compressible nature also unfits it for use below low

water, with the great weight and head to which it would be subjected. The objections to the exclusive use of earth are the depth of water in which it is to be deposited and the necessity of completing a work of this material between two successive floods, or else of protecting it in an incomplete state against a flood, at great risk and cost. The objections to stone are its great weight and cost. These considerations decide the Commission, in case this work is done, to favor a dam consisting of two transverse stone retaining walls, built of riprap and extending up to low water, with outer slopes of 1 on 2 and inner slopes of 1 on 1. The distance between the crests of these walls will be the width of the base of an earthen embankment with slopes of 1 on 4, a crown of 40 feet, and of the requisite height. The earthwork should be thoroughly faced with stone.

This being the advisable construction of the dam, the Commission is confident, from the foregoing considerations, that the location in the Atchafalaya offers advantages of security and economy not found in Old River, and also that the dam should be placed below the mouth of the Bayou des Glaizes, through which stream a large volume of overflow enters the Atchafalaya. The contents of this dam will be about 3,000,000 cubic yards of earth and 200,000 of stone, for which an estimate of $2,000,000 is submitted.

Second. The overflow of the Atchafalaya Valley, as measured in the flood of 1882, is much greater than the discharge of that river within its bed. But as this is largely composed of Red River water, and the overflow would have free access to the stream through innumerable bayous below the dam, on either side, it is as important to exclude this overflow as the discharge of the stream itself. The work required to effect this would be the raising of the levees on the south bank of the Bayou des Glaizes, and up the left bank of the Atchafalaya from the dam to its head and along the south side of Old River to the Mississippi; for which an estimate of 1,400,000 yards, at 25 cents, or $350,000, is submitted.

Third. It is not presumed to be the intention of the Government to close inland access to the navigation of the Atchafalaya, Teche, and other streams of that system, 500 miles in length, through a country annually sending out $8,000,000 of agricultural products, as shown by the census of 1880, and for the improvement of which the plans and appropriations have already, from time to time, been made by the Government.

Locks at Plaquemine and the improvement of Bayou Plaquemine and Grand and Atchafalaya rivers are essential to connect this navigation with the Mississippi in case the above-mentioned dam is built, and are therefore considered as constituting an essential part of the project. An estimate to give 5 feet navigation has been prepared for this work, under the direction of the Commission by Maj. A. Stickney, Corps of Engineers, U. S. A., and is now submitted:

Locks and improvement of Bayou Plaquemine	$1,167,648 40
Improvement of Grand River	285,972 50
Improvement of Atchafalaya River	108,000 00
Total	1,561,620 90

Fourth. The gaugings made by the Commission in the vicinity of the mouth of Red River during the flood of 1882, established the following facts: In that year about 1,950,000 cubic feet per second reached the latitude of the mouth of Red River from the drainage basin of the Mississippi, of which 1,450,000 came down that river and 500,000

through the Tensas Basin as overflow. To this volume the Red and Black rivers added about 250,000 feet. The discharge below Red River was approximately distributed as follows: Past Red River Landing, 1,595,000; overflow between Red River Landing and Carrollton, 674,000; past Carrollton, 921,000; down the Atchafalaya, 281,000; and overflow through the Atchafalaya Basin, 324,000 cubic feet per second. The completion of the work required by the last river and harbor bill as quoted above would, under conditions similar to those of 1882, have increased the discharge below Red River to 2,200,000 cubic feet—605,000 cubic feet, or 38 per cent. With the discharge actually occurring in that year the overflow was 674,000 cubic feet. With the above increase it would have been 1,279,000 cubic feet per second.

The difficulty and risk attending the execution of this plan are apparent from the following considerations: The conditions below Red River have been sustantantially unchanged since the completion of levees up to that point, over fifty years ago. Since that time the flood discharge at Red River Landing has repeatedly approximated 1,500,000 cubic feet per second, while the highest flood on record at New Orleans, that of 1883, gave, by actual measurement, less than 1,100,000. The surplus above this latter amount has been lost over and through insufficient levees. During these many years the larger volume passing Red River Landing has failed to excavate for itself sufficient waterway below. The reason is obvious. The power of the discharge above must be controlled and converted into work by levees offering greater resistance than the bed before the discharge can be increased. The measure of the work required of the river will first be indicated by an increased slope. But this is not possible on that part of the river under discussion, as the levees are already awash for hundreds of miles in great floods, and are only held by temporary devices. Hence they must be raised during the transition period and until readjustment is reached. In the next place, full security during and after the execution of the work cannot be assured without higher levees. It is entirely possible, and therefore must be provided for as a contingency of the work, that for a series of years there may be no flood of magnitude nor coincidence of floods in the two rivers. Thus, from 1877 to 1881, both included, the flood only once, and then barely, attained mean high-water mark, or 3 feet below the crest of the levee at Baton Rouge as determined by the average height of all known gauge records below Red River. During such a period the closure of the Atchafalaya might be completed without, in any one year, throwing into the Mississippi below a volume greater than the average flood discharge under present conditions. In such case no progressive enlargement of bed could be expected, and when after the completion of the dam a great flood should come, as did in 1882, or the floods of the Mississippi and Red should combine, the full effect of the work, as indicated in the raising of the flood-plane, would practically have to be encountered in a single year.

For the cost of the increase of levees, assumed to be necessary during the execution of the foregoing plan, estimates are submitted.

The estimates are divided into two parts, the first of which represents the amount necessary to place the present system of levees in such condition as they ought to be to safely restrain the floods now occurring, without any change of conditions at Red River. This is assumed at a mean raise of 2 feet in the grade.

The second part represents the additional work directly consequent upon the changes at Red River proposed by the plan now under discussion, assumed at 2 feet of additional height.

To restrain floods of the heights recently experienced on the Lower Mississippi the levees would have to be raised below Red River, and for this purpose a mean increase of height of 2 feet has been taken, and the amount required is $2,872,500.

The plan under consideration if executed will increase the volume of these floods, and necessitate a further increase of grade.

This is also assumed at 2 feet mean raise, and the amount required for this work would be $3,727,500; total, $6,600,000.

Total estimate for the execution of the project.

Dam	$2,000,000
Connecting levees	350,000
Locks and improvment of connected rivers	1,561,620
Raising levees below Red River	6,600,000
Total	10,511,620

The objections to this plan may be summarized in the statement that it is costly, difficult, and dangerous beyond the necessities of the case.

There is no evidence that there ever was a time when the entire discharge of the Red and Mississippi at their greatest floods passed, or could pass, down the Mississippi channel. The attempt proposed by this plan to compel such a result is an experiment with the forces of nature on an enormous scale and by a method which admits of no qualified trial. The head of the Atchafalaya being once shut up, the entire flood and all floods must be carried to the Gulf down the main channel.

Four feet is the height which has been assumed as the mean addition to existing levee grades below Red River necessary to provide for this increased discharge. This addition would not be uniform, but would exceed the mean along a considerable portion of the river's course. Crevasses are possible in the best-built and best-guarded levees; and when they do occur every foot of the dam across the Atchafalaya would flood elevation above the level of the surrounding country adds greatly to their disastrous effects. At the elevation to which a great flood would be carried by the execution of this plan in some parts of the rivers below, where the adjacent country is highly cultivated and densly populated, a crevasse would come with a fury and destructiveness to which no former experience would furnish any parallel. The dangers here indicated would exist in a peculiar degree at the proposed dam across the Atchafalaya. Such a dam as would be necessary in this case, upon the foundation existing for it, cannot be regarded as a structure beyond the reach of accident, however well made or watched; and the breaking of such a dam, with a head of 52 feet against it, and the empty Atchafalya Basin below, it would be an appalling event. That it would immediately precipitate one of the very disasters it was designed to prevent, viz, the cutting of a deep channel from the Mississippi River into the Atchafalaya Basin, would seem inevitable.

It may be said that the result of turning this increased volume down the main channel will be to increase its section by scour, and so provide adequate capacity of discharge without raising the present flood level. That its tendency will be to enlarge the channel is undoubtedly true. But the increased flood height must come first as a cause; the enlargement afterwards as an effect. How soon or to what extent the effect will follow the cause, no one knows. To assume that it will come in a few years, and act upon that assumption in a case so grave, is to stake tremendous consequences on the soundness of a theory.

It may be said also that the plan submitted hereafter by the Commission involves in its final execution a discharge in the main river below, of the same volume which this plan will require, less only the discharge of Red River. To which it may be answered that this is of itself a substantial difference, being equal to one-eighth of the discharge above Red River; and that in its relations to this river below it is a very important difference. When a great flood confined between levees has passed the point of safety, each inch of additional rise adds to the danger in an increasing ratio. To which may be added the more important fact that the plan submitted by the Commission has this exceeding advantage, that it can be executed by installments, and tested as it proceeds, without taking at once and involving enormous risks.

The presentation here made of this plan, and of the objections to it, have been extended to some length because a clause in the last law making appropriations for the Mississippi River appears to anticipate, if indeed it does not direct, the treatment of Red River in the manner contemplated in the plan here discussed. The funds available out of the appropriation were insufficient, however, even to begin a work of such magnitude. And inasmuch as the Commission is compelled, for the reasons stated, to disapprove the plan, it seems proper that the subject should be fully discussed at this time.

Other plans which have been proposed will be briefly discussed.

The separation of the Red and Atchafalaya from the Mississippi.

The separation of the Red and Atchafalaya from the Mississippi River has been proposed by extending and connecting the levees on the right bank of the Mississippi, above and below Old River, with a dam across that channel. This dam would have to be constructed with the same methods and materials as that previously discussed for the Atchafalaya. While it would not be of equal magnitude with that dam, either in length or height, or in the depth of water in which it must be built, the foundation would be in the loose deposit with which the bed of Old River is filled. The opening of the Plaquemine route, as previously described, would also form part of this plan.

The discharge below Red River, on the basis of the flood of 1882, would be increased 355,000 cubic feet per second, or to 1,950,000, which would still require some elevation of levees below.

The connection of the dam with the adjacent levees would be more expensive than in the previous plan. Estimates are submitted without recommendation.

Cost of dam	$1,200,000
Connecting adjacent levees, 2,000,000 yards, at 25 cents	500,000
Locks and improvement of Plaquemine, Grand, and Atchafalaya rivers	1,561,620
To make secure present levees below Red River, assumed, as before, at a mean raise of 2 feet in their grade	2,872,500
To provide for the increased discharge below Red River consequent upon the execution of this plan would require an additional raising of grade, which, assumed in this case at 1 foot mean raise, would require	1,927,500
Total	8,061,620

Major Stickney's project.

A project has also been submitted by Maj. A. Stickney, Corps of Engineers, U. S. A.

This plan proposes as its fundamental feature to raise the bed and

water surface of the lower Red and upper Atchafalaya by means of submerged dams, and will be found fully stated by its author in Appendix I of this report.

Major Stickney's estimate for the execution of his plan is $2,151,660.

If the increase of discharge down the Mississippi indicated by Major Stickney as the result of his plan were realized, we believe the following estimates for levees would be necessary as a part thereof.

To make secure present levees below Red River, assumed, as before, at a mean raise of 2 feet in their grade	$2,872,500
To provide for the increased discharge below Red River consequent upon the execution of this plan would require an additional raising of grade, which, assumed, as in the last case, at 1 foot of mean height, would cost	1,927,500
Total	4,800,000

Plan for the rectification of the Red and Atchafalaya rivers by preventing further enlargement of the latter stream and restricting its outlet capacity.

The object sought to be accomplished in the plan which is now described is the control of the outlet discharge through the valley of the Atchafalaya and the checking of the enlargement of its bed.

It is not the opinion of the Commission that the diversion of the Red River into the Mississippi is of the importance to the maintenance and improvement of the main stream that would render expedient the expenditure and risk that would be incurred by the magnitude of the project and the precautionary work necessary on the lower levees. Any reasons in favor of this plan are valid only in connection with the navigation of the tributary.

To some extent the repair of existing levees along the Tensas front, now in progress, will tend to reduce the strain upon the Atchafalaya, but to provide absolutely against any injury from the augmentation of floods in the main river below, some increase in the height of the levees below Red River will be necessary in this or any of the projects hereinbefore discussed.

The plan is as follows:

A series of brush-dams should be placed in the Atchafalaya, with the upper one below the Bayou des Glaizes, and the others at intervals not exceeding one-quarter of a mile. These dams should be built up to just below low water. It is the intention that these dams shall permit the passage down the Atchafalaya of a volume equal to the flood discharge of Red River, and in construction their height and the width between spurs can be so adjusted as to accomplish this result. It is also entirely practicable that these dams should be so located and constructed as to form part of a high-water dam, should the building of such be specially directed by Congress.

They should be constructed of a sill not less than 300 feet wide, up and down stream, and extending transversely up to the high-water banks. Above low water they should be heavily riprapped. The dam should be built upon this sill with concentric and diminishing cribs constructed as those now being used in New Orleans Harbor. While the ends of these cribs would reach about to low water, their concentric position would leave a depression not less than 5 feet deep over the middle of the crest to afford at all stages access to the navigation of the Atchafalaya.

The design for the dams as described has been used for purposes of estimate. If constructed, the details may be materially modified.

From the levees on either side of the Atchafalaya, and opposite the ends of the dams, earthen spurs should be built out as far as possible. These spurs, and any surfaces of adjacent levees or banks, where necessary, should be substantially riprapped. These spurs and the levees with which they connect, extending up the left bank of the Atchafalaya to Old River and thence to the Mississippi, and also along the south side of the Bayou des Glaizes, should be raised above any overflow.

Estimates for this project are submitted.

Six dams, with riprap and spurs, at $160,000 each	$960,000
Raising adjacent levees	250,000
To make secure present levees below Red River, assumed as in previous cases at 2 feet mean raise	2,872,500
To provide for the increased discharge below Red River, consequent upon the execution of this plan, would require an additional raising of grade, which, assumed as in the two preceding cases, at 1 foot increase of mean height, would cost	1,927,500
Total	4,800,800

Within a few weeks past the Commission made a careful personal inspection of the Atchafalaya River throughout its entire length. The water was at a low stage, and the opportunities for an examination of the stream and its banks were good. For a short distance from its head it has high banks and a deep capacious channel, which is gradually, but not rapidly, increasing in size. As it descends, the channel grows narrower and shallower, and the banks lower, and the evidences of recent enlargement gradually disappear. It is obvious that a large part of the water which enters between the high banks at the head is dissipated over the low banks below and finds its way to the Gulf in the form of general overflow. This overflow is so impaired in its progress by the dense forests of the swamps that it moves but slowly, and soon piles up to an elevation which limits the discharge from above.

Nearly, if not quite, all the water which flows down the Atchafalaya at the present time during flood stages comes from the Red and Black rivers and the Mississippi overflow into the Tensas Basin. There is now no tendency in lower Old River to enlarge; on the contrary, it appears to be closing. While present conditions continue there is not, in the opinion of the Commission, any immediate danger that a deep-water connection will be formed between the Mississippi and the Atchafalaya. On the contrary, there seems to be more danger that the bed of Old River will close and so sever the low water of the Red and the Mississippi rivers by a natural process, though of the future course of these changes it is impossible to affirm anything certainly. But the complete closure of the levees on the Tensas Front, an event likely to occur at an early date, will change very materially these conditions; and at flood stage of the Mississippi coincident with relatively lower stages in the Red there would be likely to be a large outflow through Old River. If this were left entirely unrestricted there would be danger of changes in the channels of Old River and the Atchafalaya, which might occur with suddenness and make their subsequent correction very difficult. The possible consequences of such changes would be so grave that no reasonable precautions against their occurrence ought to be omitted.

The submerged dams proposed in the last-mentioned plan will contract the present discharge capacity of the Atchafalaya only slightly, so that unless they shall be supplemented by levees to prevent the entrance of overflow water into the Atchafalaya Basin, the quantity of

Mississippi water escaping into that Basin will continue substantially unchanged.

This leads to the consideration of the Atchafalaya as an outlet, and to the question of its closure or restriction as such. The Commission entertains no doubt of the truth of the general proposition frequently heretofore stated, that the tendency of an outlet of substantial discharge is to impair the efficiency of the main channel below it. The complete closure of the Tensas Front will transfer the discharge of the present outlets along that front to the mouth of Old River and the space between that point and the foot of the Tensas levees. That the tendency of a permanent outlet so large and so sharply localized will be to impair the main channel below seems certain. The extent and rapidity of such impairment it is impossible to predict. But that it may result in the formation of a bar or series of bars great enough to obstruct navigation and in the abnormal widening of the channel, which is the usual concomitant of such bars, is possible.

The prevention of this escape can be accomplished only by cutting off the overflow into the Atchafalaya Basin by levees across its head. These, by preventing high water outflow through Old River, would also add to the security of that channel against dangerous enlargement, and so constitute a logical part of the plan proposed, whether that be considered as a means for the closure of an outlet merely, or as a precaution against the divergence of the Mississippi into the Atchafalaya Basin.

But, for the reasons already stated, the levees across the head of the Atchafalaya Basin cannot be constructed without exposing the country on the main river below to disastrous overflow, until the levees below Red River shall have been raised, and until that time the execution of that part of the plan must necessarily be deferred. The extent of such necessary additional levee height below Red River, and the probable cost of it, are given in connection with the statement of the first plan hereinbefore described.

The present recommendation of the Commission is confined, therefore, to the construction of the submerged dams described, designed to prevent further enlargement of the Atchafalaya.

The keeping open a navigable channel from the Red into the Mississippi River is not necessarily connected with any of the projects hereinbefore described, but in connection with the last plan described could, it is believed, be promoted by the following work. The limit to this improvement is the bar which invariably forms in the mouth of a tributary under the influence of back water from the Mississippi, and which the discharge of the tributary is unable to remove. Thus, the mouth of the Mississippi goes down to 3½ feet, and of the White and Yazoo to about 3 feet.

It has been proposed to effect this by placing a low-water dam across Old River, between the Red and Atchafalaya, whose crest shall have an elevation of about 10 feet above the obstructions in Upper Old River, and thus deflect the Red River, when below this stage, down Upper Old River, which, before the present conditions, induced by the enlargement of the Atchafalaya, was the natural and better channel. The redevelopment of this channel would probably require the assistance of dredging and spur-jetties, for which no reliable estimate can be made. It is probable that work of this description would still be required if the entire flood discharge of the Red River were deflected in this direction. The cost of dam would be $125,000; probable cost of dredge and etties, $275,000; total, $400,000.

While it is believed that the effect of this plan will be to deepen the access to Red River and confine the difficulty of navigation, which now extends over 6 miles, to its immediate mouth at the Mississippi, it is doubtful if the condition there admits of a depth of navigation greater than is now found at the mouths of other tributaries, or at the mouth of Red River itself before Shreve's Cut-off. The plan is therefore submitted as presenting this limited advantage, with an estimate, to enable Congress to judge of the advisability of its execution.

LEGISLATION.

The Commission renew the recommendation heretofore made that provision be made by law for the appropriation by the United States, through proceedings in the Federal court, of land and material needed in the work.

On this point reference is made to the suggestions of the last report, without repeating them here.

FINANCIAL STATEMENT.

Appropriation for surveys and expenses of the Mississippi River Commission, act of July 7, 1884.

Balance on hand December 1, 1883	$67,080 88
Appropriated by act approved July 7, 1884	75,000 00
	142,080 88
Expended from December 1, 1883, to November 30, 1884, including estimated liabilities	87,961 73
Balance which it is estimated will be required during the remainder of the fiscal year ending June 30, 1885	54,119 15
	142,080 88

Appropriation for surveys of Mississippi River, act of July 5, 1884.

Amount appropriated	$75,000 00
Expended to December 1, 1884	40,247 52
Balance which it is estimated will be required during the remainder of the fiscal year ending June 30, 1885	34,752 48
	75,000 00

The estimates of funds for fiscal year 1886, which were transmitted to the honorable the Secretary of War on July 25, 1884, are here repeated.

Estimate of funds for the Mississippi River Commission for the fiscal year ending June 30, 1886.

RIVER AND HARBOR BILL.

For continuation of surveys of the Mississippi River between the Head of the Passes, near its mouth, and its headwaters, now in progress; to make additional surveys and examinations of said river and its tributaries; to make such additional examinations and investigations, topographical, hydrographical, hydrometrical, as are necessary for maturing a plan for the permanent improvement of the entire river	$100,000

SUNDRY CIVIL BILL.

For salaries and traveling expenses of the Mississippi River Commission, and for salaries and traveling expenses of assistant engineers under them, and for office expenses and contingencies	$100,000

The estimates of funds for works of improvement for the fiscal year 1886, which were transmitted to the honorable the Secretary of War July 25, 1884, are here repeated.

Estimates of funds for the improvement of the Mississippi River for the fiscal year ending June 30, 1886.

For continuing the improvement of the Mississippi River from Des Moines Rapids to the mouth of the Illinois River	$500,000
For continuing the improvement of the Mississippi River from the mouth of the Illinois River to Cairo, Ill	1,000,000
For continuing the improvement of the Mississippi River from Cairo, Ill., to the Head of the Passes, including the improvement of the Red River at and below the head of the Atchafalaya	7,000,000

In addition to the foregoing, the following special estimates for improving the harbors named in the last river and harbor bill, as set forth in the body of this report, are recapitulated.

For improvement of the following harbors:

Columbus, Ky	$80,000
Hickman, Ky	270,000
Memphis, Tenn	75,000
Greenville, Miss	186,000
Vicksburg, Miss	20,000
Natchez, Miss	700,000
New Orleans, La	683,600
Total	2,014,600

FINANCIAL STATEMENTS, NOVEMBER 1, 1883, TO SEPTEMBER 30, 1884.

(Appropriations for improving Mississippi River, acts March 3, 1881, August 2, 1882, and January 19 and July 5, 1884.)

Balance in hands of disbursing officer November 1, 1883		$391,243 30
Less balance of first appropriation	$36,230 86	
Less deposits from sale of coal, credit of general service	126 00	
		36,356 86
In United States Treasury November 1, 1883		354,886 44
In United States Treasury November 1, 1883		607,025 90
Allotments since November 1, 1883		3,337,290 00
Unallotted in Treasury		12,710 00
Deposited by Captain Sears		40 50
Deposited by Captain Knight		20 00
Total		4,311,972 84
Expended November 1, 1883, to September 30, 1884		2,307,428 15
Balance available September 30, 1884		2,004,544 69
Estimated expenses to December 31, 1884		1,481,924 46
Estimated balance for carrying on work and care of property to January 1, 1885		522,620 23

Q. A. GILLMORE,
Colonel of Engineers, Brevet Major-General, U. S. A.,
President of Commission.
CHAS. R. SUTER,
Major of Engineers, U. S. A.
B. M. HARROD,
R. S. TAYLOR,
S. W. FERGUSON,
HENRY MITCHELL,
Coast and Geodetic Survey.

I have signed the above report with some misgivings as to the purport of the two articles entitled, respectively, "Levees and Outlets" and "Rectification of the Red and Atchafalaya Rivers," and I feel constrained to make my own conclusions a little more apparent.

The first article is valuable as furnishing all the information in the possession of the Commission concerning the effect of levees as means of improving navigation; but it seems to be implied that this information is now adequate to warrant a complete system, in which I do not concur.

The Commission has undertaken the reconstruction of levees along the fronts of the Yazoo and Tensas basins, with the expectation that these would improve navigation and determine the value of this means of improvement as compared with other means under trial. The results of these costly experiments have not yet been ascertained, and until benefits have been discovered from repeated surveys at low water there would seem to be no ground for recommending a complete application of the levee system.

This "complete application" would, it appears, necessitate the raising of all the levees now existing between Red River and the Gulf of Mexico, because it would precipitate into this—the most valuable part of the river—a greatly increased flood.

Before recommending or in any degree favoring such "complete application" of the levee system, I prefer to await the results of our own experiments, and I will add that these results will much exceed my expectation if they justify the extension of levee work 270 miles beyond the obstructed portion of the river, and the introduction of a change of regimen where no change can be for the better.

Relative to the second article, entitled "Rectification of the Red and Atchafalaya Rivers," I have felt that the Commission was not justified in assuming that the order of Congress to deflect the waters of the Red River from the Atchafalaya contemplated the augmentation of the flood heights and flood velocities below Red River, where no improvement to navigation demands it. I therefore regard the discussion of plans involving great systems of levees as irrelevant and unfortunate where not accompanied by explicit condemnation. To my mind the order of Congress finds its proper response in the plan recommended for obstructions in the Atchafalaya and the suggested dam at the head of Turnbull's Island for deflecting the Red River.

HENRY MITCHELL,
Coast and Geodetic Survey.

Hon. ROBERT T. LINCOLN,
Secretary of War.
(Through the Chief of Engineers.)

NEW YORK, *December* 23, 1884.

1. In the preceding report the Mississippi River Commission has recommended the extension of the work below Cairo, to include the New Madrid Reach, and the commencement of a systematic revetment in seriously caving banks from Cairo down. It has submitted an estimate of $7,000,000 for work below Cairo, for the coming fiscal year, exclusive of harbor works.

Not concurring in either the recommendation or the estimate, it is proper to give my reasons for dissent.

2. The original estimate of the Commission for 38 miles of the Plum Point Reach was $1,432,000; and for 25 miles of the Lake Providence Reach, $1,238,000.

It is now certain that the cost of these works will be not less than *three* times the original estimate, and even yet it is not practicable to state with definiteness what the ultimate cost will be.

So far as the actual experience of the Commission goes, the loss of work has been large, but that experience is not yet extensive enough to show how much these losses can be reduced in future, nor, after works are completed, how much the annual cost of their maintenance will exceed or fall short of 5 per cent. per annum. As the advisability of the extension of the system of works over the whole river depends on the relation of the final cost of the system, and of its annual maintenance, to the value of the resulting benefits, I am not prepared to recommend any large extension of the appropriations or of the works till those costs are approximately known.

3. A majority of the Commission state, "We therefore conclude that levees, such as have been herein described, are, in connection with an equalization of width and the prevention of caving, an important part of any general and systematic plan for the improvement of the navigation and the prevention of destructive floods."

I am unable to learn from the report, exactly or approximately, what heights the levees "such as have been herein described" are to have, but as "preparations must also be made in the grade for such increase of flood elevation as will at first * * * result * * *," I infer that the levees "herein described" are to retain such large floods as occur every few years. I fully concur with the majority as to the necessity of such levees, to restrain destructive floods, and believe it to be the only method by which the great value of the bottom lands of the Mississippi can be fully developed.

I do not concur in the opinion that such levees will have any considerable value in improving low-water navigation. As I have stated in previous reports, the cause of bad low-water navigation is excessive low-water width. It is only where such excessive widths occur that navigation is bad, and if by means of levees some hundreds of thousands of cubic feet per second of discharge at the top of the flood were added to a discharge which now is 1,200,000 or 1,400,000 cubic feet, while it might in some degree lower the bed of the river, unless it also narrowed the low-water river, it would give no sensible increase of low-water depth on the bars at these wide places. Where the river is now shoal and a mile or a mile and a half wide, it is difficult to see how levees on the bank of the river will produce any sensible contraction of width or sensible increase of depth, and it is only at wide places that increase of low-water depth is needed.

The river itself does not appear to support the theory that bad navigation is due to escape of flood water over the banks. The flood discharge of the river, as it now is, varies at different places between about 1,000,000 cubic feet per second at Carrollton and 1,800,000 or 2,000,000 cubic feet at the Ohio or at New Madrid. At New Madrid nature has supplied levees which practically confine the flood waters up to the highest stage. Here she has tried the experiment which the Commission are also trying, and the result is that immediately below New Madrid one of the worst, if not the worst, pieces of low-water navigation now on the river exists.

Again, if lack of flood-water which escapes into the river bottoms were the main or an important cause of bad low-water navigation, since below New Madrid the flood discharge decreases gradually to just above the mouth of the Saint Francis, where it does not much exceed 1,000,000 cubic feet, it would seem that on all the straight portions of the river

here the navigation should be bad. The fact is that interspersed between the bad reaches are others having no greater flood discharge than those above them, and yet where the navigation is good. If bad navigation arose from decreased flood discharge, there should be a marked deterioration in passing from New Madrid with 1,800,000 discharge, to just above the Saint Francis with 1,000,000 flood discharge. It does not occur.

It may be asked, What causes the excessive low-water widths which give bad navigation? If the comparisons of the old with recent surveys showing changes in the river, given in the plates of the Mississippi River Commission Report for 1883, be examined, it will be seen that at the same place, in widely different years, the river may now be wide and now narrow, and that there is in general a traveling of bends and peculiar forms down the river. This suggests that the special width or narrowness, and hence the good or bad low-water navigation at a given place, does not depend exclusively, nor even mainly, on the forces acting to-day, but rather that the actual form of the river at a given place is merely the recorded history of what has occurred there during many years past, and that where to-day the low-water navigation is good or bad, fifty years from now the state may be reversed, and that without any change in flood discharge.

If, in a straight reach, where navigation is now good, the river, changing the thread of its current from some slight causes, were to attack alternately one bank and the other—if this continued the result would finally be a wide river and bad navigation. The reverse process would turn a bad part of the river into a good one. These changes might occur just as well with a flood discharge of 1,800,000 as with one of 1,000,000 cubic feet; in other words, it might happen just as well with as without levees.

Not holding the opinion that bad low-water navigation is caused in any considerable degree by escape of flood water over the banks, I cannot attribute any value to levees as aids to low-water navigation commensurate with their cost.

Below Red River, levees for the improvement of navigation are not needed, as the navigation there is good, and any reactionary influence to improve the low-water navigation above would be very small.

4. For the Red and Atchafalaya rivers the Commission approves a plan which proposes to put a submerged dam across the Atchafalaya—ultimately to stop by levees all escape into the head of the Atchafalaya Basin except 281,000 cubic feet per second through the dam; and to build a low-water dam across lower Old River, between the Atchafalaya and the head of Turnbull's Island.

I concur in the propriety of checking the enlargement of the Atchafalaya by a submerged dam, as, if its enlargement went on indefinitely, the main Mississippi might go that way.

The effect of the levees would be to increase the flood discharge at New Orleans from about 1,100,000 cubic feet to about 1,900,000, and to require the levees to be raised there about 6 feet.

(In making this estimate the method used by me in the Annual Report of the Mississippi River Commission for 1883 has been followed. In reference to that method a majority of the Commission say: "Numerous facts indicate that gauge-heights for great discharges cannot be predicted by extending the curves constructed at low and medium stages with these elements as co-ordinates."

(I know of no one who proposes to use low stages for this purpose, and when, instead of "low and medium stages," medium and high stages

are used, the method is in my judgment the best at present available, and must be followed till the Commission present a better one to replace it.)

The plan, then, of stopping a large part of the escape into the Atchafalaya Basin proposes to require a large raising of the levees from Red River down at a great expense, and a permanent increase of danger to all the people living behind these levees from the greater overflow if these higher levees should be broken.

The advantages which may be supposed to follow from these levees are a theoretical improvement of navigation below Red River where it is now good, or a prevention of its deterioration, and a protection from overflow of an area of thinly-settled land in the vicinity of the Atchafalaya, small in comparison with that on the Mississippi below Red River. The disadvantages appear to far outweigh the advantages.

The Commission recommends the construction of a low-water dam across lower Old River above the Atchafalaya, and the formation of a channel on the north side of Turnbull's Island. The estimated cost is $400,000.

I fear that the opening of the channel would cost twice or three times the estimate, and that after the completion of the works the mouth of Red River would sometimes close unless dredging were used.

So long as the relative oscillations of the Mississippi and the Red may give nearly still water, loaded with sediment, in both lower and upper Old River, for many weeks at a time, it is very doubtful if in such cases the low-water flow of the Red River can keep, in dry seasons, a low-water channel open.

I should prefer to continue annual dredging rather than to execute a costly work whose results are so uncertain.

C. B. COMSTOCK,
Lieutenant-Colonel of Engineers and Brevet Brigadier-General.

Hon. ROBERT T. LINCOLN,
Secretary of War.
(Through the Chief of Engineers.)

Itemized statement of expenditures for surveys and expenses of Mississippi River Commission.

[Appropriation of March 3, 1884.]

Items.	Services assistant engineers.	Services rodmen, &c.	Outfit.	Supplies.	Subsistence.	Fuel.	Repairs.	Transportation.	Mileage and traveling expenses.	Miscellaneous.	Totals.
Commissioners' salaries											$8,783 33
Mileage and inspection		$1,819 21	$45 90	$12 25	$1,318 44	$2,389 74	$4 50	$31 20	$4,611 52		10,232 76
Flood observations		1,566 77	290 47	218 22	476 06	333 20		101 00		$14 35	3,000 00
Transverse valley curves	$238 00										238 00
Steamer and outfit											17,530 47
Contingencies	500 00										500 00
Re-examination of Atchafalaya	400 00							1 50		210 90	612 40
Gauges	1,500 00	7,324 42	363 59	548 71	1,262 74	1,593 92	832 35	365 30		169 78	13,960 81
Precise levels	770 00	1,681 26	4 30	11 01			16 75	148 50		10 00	2,641 82
Reduction of field work	30,857 98	1,046 72	132 40	679 74			4 00	81 00			32,801 84
Publication of maps											2,569 65
Hydrography and topography	8,237 68	16,410 25	555 54	667 09	5,723 39	985 07	4,840 24	1,081 26		94 03	38,594 55
High and low water marks		1,969 41	47 30	268 62	827 51	712 33	120 45			33 35	3,978 97
Transfer to Maj. Amos Stickney											1,500 00
Totals	42,503 66	31,817 97	1,439 50	2,405 64	9,608 14	6,014 26	5,818 29	1,809 76	4,611 52	532 41	136,944 60

Item.	Services clerks, &c.	Rent.	Fuel.	Professional works and charts.	Furniture.	Supplies.	Transportation.	Stationery.	Telegrams.	Miscellaneous.	
Office	$7,707 61	$1,200 00	$410 81	$27 20	$23 88	$38 95	$56 74	$351 66	$356 22	$261 25	10,434 32
											147,378 92

SUMMARY.

Balance from appropriation August 2, 1882	$9,841 53
Appropriation by act March 3, 1883	150,000 00
Cash deposited, sale of fuel to officers	66 00
Total	159,907 53
Expenditures for fiscal year ending June 30, 1883	147,378 92
Balance	12,528 61

SMITH S. LEACH,
First Lieutenant of Engineers, Secretary and Disbursing Officer Mississippi River Commission.

Statement of appropriations allotted and expended under the Mississippi River Commission.

Act of March 3, 1881	$1,000,000 00
Act of August 2, 1882	4,123,000 00
Act of January 19, 1884	1,000,000 00
Act of July 5, 1884	2,070,000 00
Total	8,193,000 00
Balance from former appropriations for works below Cairo, July 1, 1882	272,628 38
Balance from former appropriations for works above Cairo, July 1, 1884	18,017 89
For sale of fuel and loss of property	60 50
	8,483,706 77

Expended to September 30, 1884.

Des Moines Rapids to Illinois River	$30,914 73
Illinois River to Ohio River	87,882 14
Protection of easterly bank of Mississippi River near Cairo	5,511 51
New Madrid Reach	210,358 39
Plum Point Reach	2,030,896 80
Memphis Reach and Harbor	463,291 11
Lake Providence Reach	1,918,668 45
Vicksburg Harbor and Delta Point	147,754 44
Survey of Helena Reach	8,000 00
Survey of Saint Francis front, first district	4,873 11
Survey of Saint Francis front, second district	4,000 00
Survey of unleveed fronts, third district	999 49
Survey of unleveed fronts, fourth district	902 12
Survey of Cubitt's Gap	137 14
Survey of Choctaw Bend	2,679 86
Observations at Carrollton	3,000 00
Closing Bonnet Carré Crevasse	15,000 00

LEVEES.

Second district.

Yazoo front	80,950 00
Long Lake	15 55

Third district.

Yazoo front	343,455 75
Tensas Point	361,653 53

Fourth district.

Atchafalaya front	126,908 40
Tensas front	444,186 63
Mouth of Red River	79,092 57
Natchez and Vidalia harbors	5,579 12
New Orleans harbor	102,390 74
Balance September 30, 1884	2,004,605 19
Estimated balance January 1, 1885	522,620 23

Respectfully submitted.

J. H. WILLARD,
Captain of Engineers,
Secretary Committee on Construction, Mississippi River Commission.

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APPENDICES.

APPENDIX A.

ANNUAL REPORT OF THE SECRETARY OF THE COMMISSION UPON THE FIELD WORK OF SURVEYS AND EXAMINATIONS.

OFFICE MISSISSIPPI RIVER COMMISSION,
2828 *Washington Avenue, Saint Louis, Mo., October* 20, 1884.

GENERAL: I have the honor to submit the following report of the work of surveys and examinations during the fiscal year ending June 30, 1884.

The survey boats and launches with their mess and field outfits have been kept in working order by the necessary current repairs. This remark applies to the instruments as well. No additions to either class of property have been made during the year except a stern-wheel steamer described below. No changes have been made in the organization or methods pertaining to the classes of work previously executed.

Gauge inspection.—This work has been given greater prominence during the year than it has had heretofore. A discussion of the hydrography as well as the results of the few and irregular inspection previously made, had some time since developed the fact that the gauge records were far from reliable. The lack of correct river heights in previous years has in many cases substituted prolonged discussions for what would otherwise have been ascertained facts, and has in so far operated against the speedy elaborations of a definite plan of improvement. The principal source of error was found in the destruction of the gauges either by drift or ice, by the landing of boats, or by the scour or caving of banks.

At such times the keeper was obliged to use a temporary stick and by adding or subtracting the daily change, keep as well as he could a record of the stage of water, a process admirably suited to the introduction of large errors especially of the cumulative kind. To insure correct records the first step was to keep the gauges in position. To do this required that a party should visit each station frequently, carrying with it all necessary appliances for replacing and repairing gauges and bulletins.

Various plans which suggested themselves were tried without success, and a solution was finally found in the purchase and equipment of a small stern-wheel boat on which an inspector is constantly passing up and down the river inspecting the gauges, and by the assistance of the crew of the boat making all the necessary repairs. The party has also been able at a very slight cost to do a great deal of work formerly done by parties especially organized at considerable expense. The party has also saved a considerable expenditure formerly necessary for transportation of supplies to field parties, and for towing their boats from point to point. The boat is named the Patrol; is 110 feet long by 23 feet beam; has engines 12 inches in diameter, 5 feet stroke, and costs with a single crew about $1,200 per month.

She left Pittsburgh, where she was built, in the latter part of July, 1883. She completed her furnishing and equipment at Saint Louis, and left for her first inspection trip early in August.

Her work for the eleven months ending June 30, 1884, is as follows:

Number of miles run	13,158
Number of piece miles towing	3,412
Number of ton miles of freighting	20,000
Number of gauge inspections made	103
Average interval (in days) between consecutive inspections at any gauge	58½

Special surveys were made at Bonnet Carré November 5 to 10, 1883; 21 cross-sections sounded at Morganza November 14 to 23; 41 cross sections sounded at Waterproof Cut-off May 24 to 26; shore-lines run, water-levels determined, four cross-sections sounded, and discharge measured in cut-off and old river.

Low-water slope was determined October 11 to 31, 1883, from Saint Louis to New Orleans at 294 points.

High-water observations were made February 28 to March 27 from Memphis to New Orleans, during which time there were examined on the Yazoo Front, 116 crevasses; on the Tensas Front, 48 crevasses; on the Atchafalaya Front, 6 crevasses.

The results of these and previous measurements of the same character appear as an appendix to this report.

The following high-water discharges were measured: Saint Francis River, at Westbrook; Yazoo River, above Chickasaw Bayou; Bayou La Fourche and Mississippi River, at Carrollton, Red River, and Hays' Landings.

Stakes for measurement of caving banks were set in fifty-two caving bends.

Examinations of threatened cut-offs were made at Caulk's Point, Sarpley Plantation, and Georgetown Bend.

The total cost of the boat for eleven months, not including the salary of the inspector, was $17,089.80. Of this, $4,000 may fairly be assigned as the earnings of the boat in transportation and towing. The cost of high and low-water observations have been in previous years $4,000. The balance, about $8,000, is the pro-rata cost of the gauge inspections and special surveys.

In the prosecution of the regular surveys, the only field work done during the year has been the continuation of topography and hydrography from Cairo to New Madrid, from Caruthersville to Memphis, and from Commerce to Saint Louis Landing, a total distance of 248 miles.

The details are as follows:

Items.	First party.*	Second party.†	Third party.‡	For the three parties.
Number of miles of river	92	101	55	.....
Number of square miles of topography	227	274	136	.....
Number of square miles of hydrography	64	80	38	.....
Total area surveyed (square miles)	291	354	174	819
Total field cost	$13,301 86	$12,558 97	$9,367 44	.....
Cost per mile of river	144 59	124 34	170 31	.....
Cost per square mile of survey	45 71	35 47	53 84	$43 01

*Assistant J. A. Ockerson. Randolph Point to Francis Chute, and Commerce to Saint Louis Landing.
†Assistant L. L. Wheeler. Caruthersville to Randolph Point.
‡Assistant C. M. Winchell. Cairo to New Madrid.

The work done in the previous years was 1,135 square miles, at $57 per square mile. The assistant engineers have continued to merit the favorable mention heretofore made of them. A reduction was reluctantly made near the close of the fiscal year in consequence of lack of funds. The work of the office having so increased as to make it impossible for me to supervise it in detail, the organization was recast, with three divisions, known as the topographical, computing, and clerical divisions, which were placed in charge of Assistant Engineers J. A. Ockerson and L. L. Wheeler and Chief Clerk A. E. Symmes, respectively. These gentlemen have conducted the work of their divisions to my entire satisfaction, and their efforts have been of great assistance to me.

The process of printing letters and figures on the manuscript maps mentioned in last report has been in constant use during the year, and has now established itself as a standard method.

It is therefore deemed proper to give in some detail a description of the appliances and the method of their use. This is furnished in the following extract from the report of the chief of the topographical division:

"STAMPS FOR LETTERS AND FIGURES.

"This consists essentially of a piston carrying a type-holder in which words may be set up from common type, and a supporting frame. The piston is carefully fitted so as to move smoothly in a plane at right angles to the base of the frame. A spiral spring in the piston raises it from the paper after the impression has been made. The base of the frame is made so that the sides are parallel and at right angles with the line of the type when in the holder. By means of a ruler or T square the letters may be made always vertical and the different words in parallel lines. Words in curved lines may be made by using single letters, or by means of an elastic frame in the type-holder, which could be curved by an opposing screw.

"Words can be printed in any desired position by inspection or by pasting paper on the bottom and cutting out the same on a line along the type and marking in pencil the position of the word. The styles of lettering are only limited by the variety of type used. In the preparation of ordinary topographical maps it is desirable to have ten small fonts of letters, and figures for each, except those for State names and titles.

"When the same word occurs frequently, as in the cases of kinds of timber, character of river bed, numbers of contours, &c., the printing is done very rapidly. Even

where it is necessary to set up and distribute the type for single words it is much more rapid than hand work.

"In printing soundings, three disks are used. They are made with slots for the ten digits, and the figures fitting in snugly are held in place by friction. They can readily be replaced by new type when they become worn. It is evident that by the use of three disks any combination of figures from 0 to 999 can be made by revolving the disks so as to form the required number. After the desired combination is made, the figures are inked, and the disks all turned down to an index, which shows when they are in proper position to print evenly. After inking they are then pressed against the paper at the point where the figures are desired.

"The best quality of printer's ink is used, and it is applied with a small roller made from the common roller composition."

Mr. Ockerson has continued his inquiries and experiments in this field, directing them to the development of means and methods for printing the conventional signs. The success thus far attained is set forth in the following extract from his report:

"HAND PRESS FOR PRINTING CONVENTIONAL SIGNS ON MANUSCRIPT MAPS.

"The first thing necessary in resorting to mechanical means for printing conventional signs is to obtain accurate types or molds from which stamps can be cast. Several efforts were made to engrave the signs in wood, but the results were never satisfactory. Experiments were then made in photoelectrotyping from small drawing, and after a number of trials a good electrotype was finally produced. Careful drawings were then made on sheets 6 by 14 inches in size, and accurate electrotypes obtained. These are the standards, and are never used except for the purpose of producing working stamps, which can be multiplied without limit.

"The drawings were prepared especially for maps which are to be reduced from scale of 1:10,000 to 1:20,000 by means of photolithography, and published by combining several detail sheets.

"The signs themselves are entirely satisfactory, and it remains to solve the minor details of manipulation."

With this in successful operation the only hand work on the maps will be the projections and outlines; a state of affairs in which the word "manuscript" will be almost a misnomer.

For details of expenditures I beg to refer the committee to the itemized statement submitted to the Commission.

SMITH S. LEACH,
First Lieutenant of Engineers, Secretary.

General C. B. COMSTOCK,
President Mississippi Commission,
Chairman Committee on Surveys and Examinations.

A 1.

REPORTS ON HIGH-WATER OBSERVATIONS.

1.—YAZOO FRONT FOR FLOOD OF 1882.

(By J. B. Johnson, United States Assistant Engineer.)

OFFICE MISSISSIPPI RIVER COMMISSION,
Saint Louis, Mo., April 27, 1882.

SIR: I have the honor to report upon my high-water observations on the Yazoo front, made March 13 to 19, 1882. I very much regret that circumstances have forced me to present the results of my observations before I have had the time to make a study of various data bearing directly on the facts of this report. I submit, therefore, my determination of the discharge of flood water into the Yazoo bottoms, with the methods by which they were obtained, and can barely hint at some of the lines of research which should be pursued in this connection, and some of the very important results which should come from such investigations. I have had but two weeks' time to give to this entire report since returning to the office, which has proved entirely inadequate to the demands of the case.

I left Saint Louis March 10, on board the U. S. S. Emma Etheridge, arriving at Memphis Sunday, March 12. There I received your written instructions, sent from Louisville. They were of the most general character, simply asking me to find as

accurately and rapidly as possible the amount of water escaping through the levee and otherwise into the Yazoo bottoms, from Memphis to Vicksburg. Since the river had fallen nearly a foot, and was falling from one to two-tenths of a foot a day, it was evidently essential to prosecute the work with the utmost dispatch consistent with a fair approximation to correct results. I was not expected to stop at any one outlet in order to make a series of experiments bearing on the law of flow of water through crevasses.

I left Memphis March 13, and stopped that night at Norfolk Landing, at the outlet of Horn Lake. Here the business commenced. It is called 400 miles from Memphis to Vicksburg. This stretch was examined in six days. I was three days, however, in going from Norfolk Landing to Helena, a distance of about 60 miles, with 106 outlets.

From here to Mound Place, a distance of 150 miles, 41 outlets were examined in 1½ days. From Mound Place to Vicksburg, 160 miles, there were no outlets on the Mississippi bank. I therefore estimated or measured the discharge through 147 outlets, reaching over a distance of 210 miles, in 4½ days, being an average of 33 outlets and 47 miles of river per day.

From Commerce to Glendale, 45 miles; Friar's Point to foot of Island 64, 20 miles; from Riverton to Clark's Landing, Lake Beulah, 10 miles, and Catfish Point to Eutaw, 13 miles, I followed the line of the levee continuously in a skiff, seldom getting out of sight of it. This gives a total of 88 miles by river, but it was probably not more than 75 miles by levee. This work was very laborious, since it was mostly through the woods, where the difficulties of propelling a skiff were very great. The levee on these stretches was often many miles from the river, and the breaks were so numerous, and flow over the levee so great, that it was found necessary to follow it rigidly in order that no outlets should be lost. For the rest of the distance the outlets consisted of large breaks in the levee whose locations were well known to people who could be seen at the landings, and they were generally close to the channel of the river, so that I came to each locality by steamer, and then took a skiff and went out to the break.

My assistance consisted of the mate of the Etheridge, who did all the sounding, and the boatmen engaged on the steamer.

I.—*General description of overflow into Yazoo Swamps.*

The outlets for flood-water into the Yazoo bottoms are of three kinds:

First. Over the natural surface of the banks, where the levee has caved off into the river.

Second. Over the top of the levee.

Third. Through breaks into the levee.

It is a very noticeable fact that there are no outlets into the Yazoo below the natural surface of the bank. In this respect this bottom differs from the Saint Francis, as well as the Red and Atchafalaya river bottoms. There are many bayous leading from the Mississippi into the Saint Francis from 6 to 12 feet below the top of the bank, so that a stage of water 5 feet below the surface of the bank furnishes a very perceptible supply of water to the Saint Francis swamps. This is not the case with the Yazoo. The flood-waters enter this bottom over the bank in but two places, at and above Star Landing (De Soto Front post-office) for a distance of 9,300 feet, and opposite Island 64 for a distance of 3,300 feet. In both places the levee has caved off into the river.

Just above Sunflower Landing (Island 66) the old levee on river bank is gone for 2 miles. The levee from below, however, turns here and runs back some 8 miles to the Friar's Point county road, which is raised a few feet above the natural surface of the ground. As the river rises over the banks, which here are 5 or 6 feet below top of this flood, the water enters this open country, but after the levees broke above, there being a natural drainage towards the river at this point, the water flowed back to the river through this two-mile break. The water that entered here probably never reached the Yazoo, but was cut off by the Friar's Point road and Sunflower levee above mentioned.

At the height of the flood the water discharged over the top of the levee in almost one continuous sheet from a point 3 miles below Commerce to the railroad embankment back of Glendale, then at frequent intervals as far as Island 64. From Sunflower to the lower line of Issaquena County, Mississippi, 30 miles above Vicksburg, the levee was intact previous to this flood. This levee is under direct control of the levee board of Bolivar, Washington, and Issaquena counties. As the water neared the top of it the levee was raised from 1 to 3 feet on almost the entire distance, as far at least as Mound Place (100 miles by river), but the river raised over it in many places for miles together, especially in the vicinity of the mouths of White and Arkansas rivers and around Catfish Point. This would often cause large breaks in the levee, which would furnish sufficient relief to lower the water below the remaining levee surface.

Wherever the levee was built of "buckshot" or "bagasse" soil, however, the wear was very slow, and in many places the water had been running over four or five weeks without wearing down the top of the levee more than 1 foot.

The water commenced running over the levee in vicinity of mouth of Saint Francis and above February 12, and on March 14–16, the river having fallen 6 to 14 inches, the water was found running over 17,300 feet of levee from Commerce to Glendale, aside from 29,500 feet of crevasses where the levee was partly or wholly gone. At and below Austin the river had fallen 12 to 14 inches, but the water had overflowed almost the entire levee at top of flood.

On March 17–19 the water was not found running over the levee at any point below Glendale, although all the breaks below there were caused by water running over the top, and it doubtless did run over in many places for a short time where no breaks occurred.

The most of the water, however, which entered the Yazoo bottoms escaped through breaks in the levee. From the tabulated discharge it appears that at least 90 per cent. of all the water escaping from the Mississippi into the Yazoo bottoms went out through these crevasses and 80 per cent. escaped through twenty breaks, that being the number of discharges of 10,000 cubic feet per second and upwards. One hundred and eleven discharges through crevasses were seen and measured or estimated on the line of the levee from Horn Lake to Mound Place. Twenty-eight occur below Sunflower, in the "Lower District," where the levee has been well kept up. The "Upper District," extending from the bluffs below Memphis to Sunflower, has been abandoned since the flood of 1874, and, though having very few breaks in it, it had been worn down in many places, and in the three places mentioned above the levee had caved into the river.

There were two localities on the Yazoo front where the flood waters, having escaped over or through the levees above, were forced back to the river again below. One is at McKinney Bayou, 2 miles above Austin, and the other is just above Sunflower. The former is caused by an intervening ridge, but the latter is only the natural drainage across a point where the levee is caved off below.

The levees broke at Mhoon's Landing, 7 miles above the mouth of McKinney Bayou, February 12. This water was so obstructed by high land between here and Coldwater Creek that in four days (February 16) it commenced running over the top of the levee back into the river 3 miles below Mhoon's, and for almost the entire distance to the mouth of McKinney Bayou, which was four miles. On February 18 the levee across the mouth of the bayou (which had a culvert in it for drainage of swamp water back to river) broke, and on March 15 the bayou proper was discharging 10,300 cubic feet per second. The highest water occurred here March 5, and on March 15 it had fallen 14 inches. At this date I found 146,000 cubic feet per second passing out of the river at and above Mhoon's Landing, and only 84,000 cubic feet coming back to the river at and above McKinney Bayou. The balance, some 62,000 cubic feet, passed back into Coldwater and on to the Yazoo. From Maj. G. M. Helm, chief engineer of the levee board for the Lower Mississippi district, I have learned that on April 21, which was the height of the flood in that locality, there were eighty breaks in the levee from the lower line of Issaquena County up to Cottonwood, 10 miles above, caused by the Yazoo overflow pouring out, back to the river again, over the top of the levee. Cottonwood is 48 miles above Vicksburg by river. The maximum width of these breaks is 6,880 feet.

II.—*Methods employed.*

In regard to the methods employed to obtain these discharges, I wish to say in advance that they were only intended to be approximate. The rapidity with which it seemed necessary to do the work would not admit of any elaborate study or series of observations at any one locality.

I shall try to describe the methods employed in sufficient detail to enable one to enter a fair judgment of the reliability of the results. This, I am aware, is the more necessary since the magnitude of the overflow seems without reliable precedent.

In the first place, I may say that where the outlet was small, either over the levee or through a small break, both the width and velocity were generally estimated; but where the discharge seemed large, the cross-section and surface velocity were obtained.

The discharge over the bank was found by estimating the width of outlet (which was afterwards checked up by the charts or maps in the office), sounding the depth at intervals and running a surface float. But since, as stated above, 90 per cent. of the entire output into the Yazoo was through twenty crevasses, each of which discharged more than 10,000 cubic feet per second, it becomes evident that if the large outlets were carefully studied the smaller ones might well be hastily inspected without introducing any large errors in the result.

It was very important, however, that all outlets, whether large or small, should be seen by the engineer himself, if for nothing else, that he might know that the discharge was of little consequence. There are many ways of arriving at the approximate dis-

charge of a crevasse, simply by looking at it. If the observer approaches the crevasse in a skiff, from either side of the levee, he can form a very good idea of the discharge from the current setting toward or from it. These breaks are almost always in the woods, or, at least, there are trees on one or both sides of it, and a person familiar with forests can tell something of the depth of the water by looking at the trees and bushes standing in it. If, however, the observer is in a skiff, he sounds for the depth of water with his oar, and if this is not long enough he has his leadsman cast his lead. Learning thus the only fact which is not directly visible, he estimates the width of the crevasse (or the length of an arc of a circle around in front of the crevasse on the line of his soundings), and he also estimates the velocity in feet per second, by throwing in chips and ticking seconds in his mind and estimating the distance traveled. In this way he can readily arrive at an approximation to the discharge and know whether it is worth his while to stop with such an estimate or to employ more elaborate means to determine the discharge. I shall refer to these more accurate methods again.

I wish here to emphasize the reliability to a tolerable approximation of these methods of estimating.

The estimate is usually made on a section outside or inside of the line of the levee. A few soundings are made on this section, as the skiff moves along in front of the crevasse or overflow, and the depth of the section determined. If the discharge is small the skiff will probably not be stopped. A fair approximation to the velocity of the water can be made by seeing how rapidly it passes the trees on the line of our section. After having made a great many accurate measurements of surface velocity, by means of a float, one can closely estimate the velocity by seeing it pass any obstruction. Knowing then the depth and velocity on our section, we know the discharge in cubic feet per second per linear foot.

If the water were 8 feet deep on the auxiliary section and has a velocity of 1 foot per second towards the levee and only the top of the levee seems to be washed off, I would call the depth on levee 2 feet and velocity 4 feet; if all the levee seems to be washed out I could say depth = 4 feet and velocity = 2 feet; in both of which cases the discharge is 8 cubic feet per second per linear foot.

This coefficient of reduction from surface velocity to mean velocity will be considered later.

This method of estimating will account for so many even numbers in depth and velocity columns in the table of discharges. The width of discharge is then estimated (width taken as the length of our auxiliary section) and the observation is complete. This, as I have said before, is for small discharges.

It may well be said that such methods would involve very large personal equations—that two persons might arrive at very different results. This, of course, must be granted, but, in justice to myself, I should speak of my long experience in pacing distances as a rodman on precise level work, and later as an observer in the same kind of work where the distance is always paced and then determined by the wire interval on the rod. The observer's mind is constantly engaged in estimating distances, all of which estimates are at once checked up by the rod readings. One learns in this way to estimate distances of 100 to 300 feet very closely. Our distances in leveling are always given in meters, and so I find I can estimate a distance in meters much better than when I try to think in feet. When the width of a crevasse was measured by stadia, in this work, it was always obtained in meters too, so that the prevalence of such distances as 330 or 660 feet in the table is explained by their having been estimated as 100 or 200 meters.

I think I may say, too, that from my childhood I have been accustomed to hear a pendulum clock tick seconds, and that I have only to imagine myself as keeping time with the old clock in order to mark seconds very closely.

So much for the estimates which appear in this report. Such means of determining discharge were not used for more than 20 per cent. of the whole amount of overflow into the Yazoo. I may say, however, that the width of a crevasse, or the length of the section across which discharge was taken, which was usually greater than the width of the crevasse, was often estimated when the section was carefully sounded, and when the surface velocity was obtained by float. This was done because to get the width by stadia the skiff would have to pass from one side of the crevasse to the other three times in order to set the observer on one side, the stadia man on the other, go back for the observer, and then pass on along down the levee. This passing of the skiff was often dangerous unless it took a wide circuit around to avoid the rapid current, and then the time required was too great. The width was most difficult to measure, therefore, and most readily estimated, and hence it was often estimated when all other data was measured.

I think the error of estimates on such distances would not exceed 10 or 15 per cent. When, however, the discharge per linear foot was seen to be great, as for a deep section with rapid current, the width was measured by stadia, if possible, and it nearly always was.

The soundings were made by the mate of the Etheridge, an experienced leadsman, with a 12-pound lead.

The velocity, when measured, was found by means of a regular ship's log, presenting 18 square inches of surface to the current, the line being a small sea-grass fish-line, running on a fishing-reel, with the least possible amount of friction. The line was tagged with different colors every 10 feet, and the reel was provided with a catch which could be thrown and the run of float stopped instantly. In using it my leadsman held the watch and called every five seconds—as "Tick—five—ten—fifteen," &c. I noted what part of the line was running off the reel at the initial "tick," and would then throw the catch at some even five seconds.

The line was about 120 feet long, and from 80 to 100 feet was usually allowed to run out. If 80 feet had run out in twenty seconds, the velocity was recorded as 4 feet per second. This velocity was obtained, of course, across the line of the section sounded.

There are but four estimates in the tabulated list of discharges that were not made upon personal inspection and observation. They are—

OUTLETS.

	Cubic feet.
Horn Lake discharge	1,000
Thompson Place discharge	12,000
Lake Beulah discharge	14,700
Total discharge	27,700

RETURN FLOW.

Above Sunflower	37,000

Making a net reflow back to the river of 10,000 cubic feet per second, based on facts not obtained by direct personal observation.

I tried to reach the Horn Lake break on the evening of the 13th of March, by rowing up the Horn Lake pass, but the current out was so strong that I succeeded in going only about 2 or 3 miles. The data obtained are thought to be tolerably reliable. This break had flooded the entire country back of Norfolk Landing, clear up to the levee on the river front. The discharge given (1,000 cubic feet) is therefore rather too small than too large.

The breaks on the Thompson Place were not visited because I knew I could get very reliable information from Captain Stancell, levee contractor, and because it would have delayed the work a half day. I saw a break some two miles above and another some three miles below, and so could form some satisfactory estimate of the velocity the water would have, for the fall through the levee would be about the same.

For the breaks on Lake Beulah that were not visited, I have this excuse. The steamer had gone from Riverton around to Clark's Landing in Lake Beulah, and I started to follow the levee in a skiff. After passing Judge Miles's the difficulties of getting a boat through became so great that I found I could not possibly follow the levee all the way to Clark's before dark. The levee also was very low—about four feet—and for the two or three breaks found in it the current was only three feet per second. At Clark's I learned that Walter Helm, assistant engineer to Levee Board, had just made a personal inspection of all that line of levee, and I could learn the facts from him at Greenville, which I did.

For the return flow of water to river above Sunflower, my data is more unsatisfactory than for any other portion of the discharge. I had been told, before starting out, that the levee above Sunflower ran eight miles back from the river and then straight to Friar's Point. At Friar's Point I learned this was a mistake, and that the levee came to the river again in the next bend below. I followed the levee continuously from Friar's Point to Island 64 and found that my first information was wholly erroneous. At a point nearly opposite Saint Louis Landing I found a small break in the levee where the water was running back to the river. This was some five miles above Sunflower. They told here that the levee was complete to Sunflower. I therefore took steamer to Sunflower, and was there told again the same story. They must have meant the levee running straight back from Sunflower to the Friar's Point road, which was intact. I therefore passed on down. On arriving at the office and consulting the field sheets of last winter's survey, I find that the old levee that follows the river from Friar's Point down has caved off in the river for two miles above Sunflower, and Assistant Engineer J. A. Ockerson says that in the high water of 1881 water was running out of this opening into the river. He also furnished me with the elevation of a high-water mark of 1881 at this point, and the general elevation of the bank referred

to same datum. Knowing the excess of flood of 1882 over that of 1881, I derived the average depth of water over this section for this flood. From the field sheets it is evident there is a natural drainage back to river here from the bend above, and from the observed velocity through the break five miles above, I thought there might be an average surface velocity of one foot per second back into the river for this entire section of two miles width. This gives a return flow at this point of 37,150 cubic feet per second.

III.—*Results.*

In appendix to this report will be found a tabulated list of all discharges, whether out or into the Mississippi River, on the Yazoo Front, from Memphis to a point some 48 miles above Vicksburg, where the Yazoo commences discharging, even over the levees, back into the Mississippi. No data were obtained on this discharge at the mouth of the Yazoo. This table furnishes—

(1) The approximate location of the outlet.
(2) The kind of outlet; whether over bank or levee, or by crevasse in levee.
(3) Date of discharge, or date of break in case of crevasse.
(4) Date of observation.
(5) Stage of water below the maximum at time of observation.
(6) Width of outlet.
(7) Mean depth of outlet.
(8) Surface velocity of water.
(9) Discharge in cubic feet per second.
(10) The partial summation of discharge for the several sections of the river.
(11) The continued summation of the net discharge from the Mississippi River into the Yazoo Swamp.

The date of the break was obtained in nearly all cases from people in the vicinity, and when this could not be done, it was taken as the date of the water commencing to run over the top of the levee.

A column giving "cause of break" would have been added, except that in all cases but two the breaks were caused by the water running over the top. In one of these cases the levee was supposed to have been cut, and in the other, which was the upper break at Bolivar, there was an escaping of water at the bottom for several days, and then the levee gave way all at once, bottom first apparently. This could have been prevented by building a "run-around," but the forces were all exhausted, having for days and almost weeks been working night and day in raising the tops of the levees.

The methods of finding width, depth, and velocity have already been discussed. The coefficient of reduction from surface to mean velocity has, however, not yet been treated. And this is, I think, the most uncertain element in the whole problem. I have used 70 per cent. as the ratio of mean to surface velocity. I can give no better reason for using this ratio than the general fact that this is about the smallest ratio on record for this relation in natural channels, and my judgment is that this is about right for crevasses. The whole question of the flow of water through a channel of rapidly diminishing depth, which is about the same as that over a submerged weir, seems as yet almost wholly unsolved. Where the flow through a crevasse is over the natural surface of the ground, with no excavation or "wash" on the line of the levee, as was the case at Trotter's Landing, the relation of surface to mean velocity would be that of ordinary flowing streams, but where there is a deep gorge washed out from the river bank, as at Riverton, or on Sunflower Lake, below Austin, which may be 30 or 40 feet deep in the line of the levee and between it and the river, but rapidly shoals up after it passes the line of the levee where the water can spread in all directions—in such a case, there can be no doubt that the ratio of mean to surface is much less than where the depth continues indefinitely. In the case of a deep hole excavated in the line of the levee, also, the ratio of mean to surface is very different from that of ordinary streams. In this case, however, I usually tried to get a section outside of the "wash." Where I could not do this, as was the case at Austin and at Bolivar, I would decide whether or not the entire section should be considered available for discharge. In two cases at Austin I thought that about one-third of each cross-section should be deducted for the effect of the eddies near each side, but in no case have I deducted anything for depth. The reason for not doing so was that in all cases where these holes existed, their effects were at once evident from the sudden checking of the velocity, and the vigorous boiling of the water as soon as the deep section was reached. The rapid exchange of position vertically, of the particles of water, caused by these immense boils, would, of itself, tend to give a uniform velocity to the entire cross-section. This checking of the current was so marked that in some places it was evident that the surface velocity must be compensated by a more rapid velocity below. A very valuable observation, bearing on this subject, was obtained at the upper Bolivar break.

This break, as measured by stadia, was 1,150 feet wide. The upper half of it was just back of a large hole which had been excavated by a previous break. On the lower half the levee had gradually washed off, but without excavating any hole. The mean depth on the upper half was 38 feet, the maximum being 48 feet. The mean depth of lower half was 14 feet, depth being very uniform. The levee here was about a quarter of a mile from the river and back of an open grove of second growth cottonwoods. There was a fall of about 2 feet from the river bank to the line of the levee, and an apparently uniform slope through the levee. The depth of overflow outside the levee was very uniform, being from 12 to 14 feet. The water passed into this break from all directions with a uniform velocity, *the discharge per linear foot evidently being nearly uniform for the entire cross-section.*

The surface velocity in the deep section was found, by float, to be 2½ feet per second (being 75 feet in 30 seconds), while the surface velocity on the shoal section was 6 feet per second (being 90 feet in 15 seconds).

Applying our coefficient of $\frac{7}{10}$ to reduce surface to mean velocity, we obtain a discharge per linear foot of 68 cubic feet on the deep section and of 59 cubic feet on the shoal section. This is an extreme case, and we obtain a discharge in the deep section 15 per cent. greater than in the shoal section, which is doubtless quite within the limits of error for each measurement.

So far as my observation goes, therefore, I think little or no deduction should be made for the depth of the hole, provided a fair average surface velocity could be obtained. The prevalence of this disturbed condition of the surface makes it difficult to obtain a surface velocity which will be near the average. For this reason it is best to try to get the section for discharge where there is a more even flow. I am sure it is a grave error to assume that the rate of flow across one of these holes is the same as though there were no excavation there. The most casual observation would correct such an impression. I do not think the existence of the enlarged section would materially increase or diminish the flow of water across it, but I do think that when the surface velocity is taken across the enlarged section, the entire cross-section should be used, except when there are well-defined eddies at the sides.

As to what coefficient should be used to reduce to mean velocity, I know of no way of determining it except by obtaining vertical velocity curves for the various conditions. Even then the new local conditions found at every crevasse would so modify the problem as to make it inapplicable.

When I started out I obtained permission to engage a number of observers to read a gauge outside and one inside the levee at the most important crevasses, and also to note the rates of widening of the crevasse from stakes on top of the levee that I would locate. I thought in this way to obtain data that could be used in deriving some formula for computing the flow through the crevasse for the remainder of the flood. I was soon convinced, however, after taking the field, that no data obtained at one locality could be applied at another, for it is the local conditions, far more than the slope through the crevasse, which determines the discharge. I therefore abandoned the scheme. The conditions here referred to are such as trees and brushes on one or both sides of the break, obstructions in the crevasse itself, such as fallen trees, and the velocity of the water towards the crevasse as it approaches the opening. In the case of the Bolivar break, the one above Delta, and many others, the water came pouring down through the woods with a tremendous current, and entered the crevasse at 6 to 8 feet per second. Here it was checked up to 2 or 3 feet per second if there was a deep wash-out, but if there was little enlargement of the section it passed right on through with about the same velocity, and perhaps with very a little fall, through the levee. On the other hand, if the discharge was not sufficient to give the water a strong entering current, or if the crevasse was on the river bank where the water had full and free access to supply the discharge without generating any great velocity, the fall through the levee might be 1 or 2 feet without creating a velocity of more than 3 or 4 feet on the line of the levee. Data obtained, therefore, from an elaborate study of one crevasse would probably give vicious results when applied to other localities.

A good example of this is seen in Humphrey and Abbot, pp. 283–301. A formula obtained from a study of the Bell crevasse was applied to the crevasses on the Yazoo front in 1858, and the computed discharge would have drained the river dry before reaching Vicksburg. By an elaborate investigation an effort was made to find what the dischargo into the Yazoo should have been, and so a coefficient of correction was obtained to apply to the formula when used for other localities, and this coefficient was $\frac{1}{3}$. It was concluded therefore that the formula gave three times too large a discharge.

If it is thought that the coefficient of .7 is erroneous, any other can be readily applied by dividing the total discharge by .7 and multiplying by the new coefficient. I can only give it as being in my judgment, and the light of such data as I have, very nearly correct.

From the tabulated discharge in the appendix we may make the following—

SUMMARY FOR YAZOO BOTTOM.

I.—*As to locality.*

	Cubic feet per second.
Outflow above Mhoon's	146,000
Return flow, Mhoon's to McKinney Bayou	64,000
Net outflow to McKinney Bayou	82,000
Outflow, McKinney Bayou to Austin	40,000
Outflow, Austin to Glendale	168,000
Outflow, Glendale to Island 64	177,000
	467,000
Return flow at Sunflower	37,000
Net outflow above Sunflower	430,000
Outflow, Sunflower to Concordia	59,000
Outflow, Riverton break	107,000
Outflow, Lake Beulah	32,000
Outflow Bolivar breaks	128,000
Outflow, Catfish Point	6,000
	762,000
Return flow on Catfish Point	1,000
Net outflow above Catfish Point	761,000
Outflow at Mound Place	21,000
Total net overflow into Yazoo	782,000

II.—*As to time.*

Outflow, January 21, 1882	20,000
Outflow, February 10, 1882	40,000
From breaks occurring February 10 to 19, from Austin to Island 64, resulting from the first Helena rise, there was a net discharge February 20 of, say	320,000
	360,000
From flow back to river over levee and through McKinney Bayou break, which occurred February 18, there was a return flow February 20 of about.	40,000
Net overflow February 20	320,000
From breaks occurring February 28 and March 1, with increased discharge of upper breaks, there was a net increase of above overflow by March 5 of, say	300,000
Net discharge March 5	620,000
From breaks occurring March 5, together with increase of discharge of other breaks, there was a net overflow March 9 (being the maximum stage at Memphis, Mhoon's, and Helena) of, say	180,000
Net discharge March 9	800,000
From direct observations the net discharge March 14, 1882	780,000

From an inspection of the gauge curves I would think the discharge had diminished to 100,000, or perhaps 50,000 cubic feet, by April 20, when the river had fallen 7 feet at Helena and 5½ feet at Arkansas City, below its maximum.

I do not think a very fair estimate could be made of the time of ceasing to overflow, for it will depend largely on the amount of shoaling back of the large breaks. It is well known that great quantities of sand are deposited over the natural bank back of these large discharges, which sometimes will raise the surface several feet, and so cause the discharge to cease that much sooner.

The analysis of the overflow given above is accurate *as to locality*, but the estimates as to time cannot be relied on with any degree of certainty. The dates of breaks as given in the table of discharge are reliable, and with sufficient time and study one might derive a fair approximation to a *curve of discharge* into the Yazoo from, say, January 21 to April 21, which are about the limits of flood discharge.

The following table gives an analysis of the widths of the discharge sections:

Kind of overflow.	Outlet.	Return flow.	Total submerged.	
Width over bank	12,600 feet.	10,500 feet.	23,100 feet.	4.4 miles.
Width over levee	16,640 feet.	8,040 feet.	24,680 feet.	4.6 miles.
Width through crevasses	37,000 feet.	4,890 feet.	41,890 feet.	7.9 miles.
Totals	66,240 feet.	23,430 feet.	89,670 feet.	16.9 miles.
Totals in miles	12.5 miles.	4.4 miles.	16.9 miles.	

IV.—*Discussion of result.*

The above is as thorough an analysis of the observed facts as I have had time to make. If proper maps were accessible it would be interesting and profitable to study the direction and course of the flood waters after passing the line of the levee.

Another profitable line of research is the effect these outlets had on the stage of water, velocity of current, shoaling of bed, &c.

Their effect on the stage is in many cases plainly apparent on the gauge curves, submitted with this report.

GAUGE CURVES.

I have plotted the curves of eight gauges on the Mississippi, one on the White, and one on the Arkansas River, from November 2 to April 22, and of seven others on the Mississippi below Cairo, through the period of the flood. These are found on Plate I.

On Plate II will be found the gauge-curves of six points on the Mississippi, viz, Cairo, Memphis, Helena, mouth of White River, Lake Providence, and Vicksburg. These curves are made to coincide both as to time and elevation. For elevation they are all referred to extreme low water at their several localities, and for time they have all been made to coincide with the Cairo curve, by moving the other curves bodily to the left as many days as it took the December wave to travel from Cairo to the given point. In this way the sharp and exceedingly symmetrical December rise has been used as an index by which to locate the carves on this plate.

The curves in Plate I are plotted directly from their gauge readings, without any reference to low water or any common datum. They all seem to have retained the same zero except that at Mhoon's Landing, which was evidently moved about a foot between March 21 and 26.

By comparing the Cairo and Helena curves on Plate II, one can see at what stage the water commences to escape into the Saint Francis swamps from the Mississippi. It is at 36 feet on the Helena gauge and 29 feet on the Memphis gauge. This is shown by the divergence of the two curves at this point. The river at Helena ceases to rise as rapidly as at Cairo, comes to a maximum seven days after it would have done had the river been within its banks, being January 10, instead of January 3, for a maximum at Cairo on December 31. Then for a fall at Cairo of 2½ feet we have a fall at Helena of two-tenths of a foot before the next rise at Cairo forced it up again.

Until the water commenced to escape in the Yazoo, January 21, the whole story of the relations of Mississippi to Saint Francis is told or, at least, indicated by the relation of these two curves (Cairo and Helena). (See Plate II, Fig. 1, December 26–January 21.)

In this connection, the December rise, from 21 to 34 feet, and back to 22 feet, all from November 2 to December 16, is of great benefit. Here the river did not get above its banks, neither did it escape through any of its outlets into the Saint Francis, and the curves are not only strictly similar, but at Cairo and Helena they are almost identical in position; also at mouth of White River and at Vicksburg. These two latter, however, are some 2 feet higher throughout this entire period, owing to a rise of 8 feet in the White River and of 3 feet in the Arkansas.

A very noticeable feature of the Memphis curve is, that for all its stages it is far below both the Cairo and Helena curves. At time of overflow this would be expected, as a result of the Saint Francis swamp overflow, but we see that a 21-foot stage at Cairo and Helena (being exactly the same elevation at the two points—see Plate II, Fig. 1) corresponds to a 14 4-foot stage at Memphis. Also a 34 to 35 foot stage at Cairo and Helena (top of December rise) gives only a 26.2-foot stage at Memphis. The top of this wave was wholly within the banks, with no escape from outlets. For the maximum of January 1, where there was a small discharge through bayous into the Saint Francis, a stage of 40.6 at Cairo and 39.5 at Helena gave but 30.4 at Memphis.

For the next maximum, January 31, with a large escape into the Saint Francis, a stage of 48.8 feet at Cairo, and 46.7 feet, ten days later, at Helena, gave but 35.3 feet at Memphis.

For the highest point of the flood, about February 28, a stage of 53 feet at Cairo, and of 47.2 feet at Helena, gave but 36.1 feet at Memphis.

Using extreme low water for a common datum, we have, therefore:

Stage of Cairo.	Stage of Helena.	Mean of Cairo and Helena.	Stage of Memphis.	Mean Cairo and Helena minus Memphis.	Remarks.
6.4	6.3	6.35	2.1	4.25	No swamp discharge, September, 1881.
17.5	17.4	17.45	11.75	5.70	No swamp discharge, November, 1881.
21.0	21.0	21.0	14.4	6.6	No swamp discharge.
34.2	34.8	34.5	26.2	8.3	Do.
40.6	39.5	40.5	30.4	9.65	Small discharge.
48.8	46.7	47.75	35.3	12.45	Large discharge.
53.0	47.2	50.1	36.1	14.0	Do.

A curve showing this relation is herewith presented. Plate II, Fig. 2.

The common datum of extreme low water was for Memphis and Helena, December, 1872, and that for Cairo was 1871. It is probable the Commerce Cut-off and other changes since these dates have changed the low-water slope so that the same extreme low-water stages at Cairo and Helena would give a stage 3 or 4 feet lower than that of 1872. To show this change of the regimen of the river at Memphis, relatively to Cairo and Helena, since the cut-off at Commerce in May, 1874, I have taken a series of maximum and minimum stages at these three points for 1873 and 1874:

Date.	Stage of Cairo.	Stage of Helena.	Mean of Cairo and Helena.	Stage of Memphis.	Mean Cairo and Helena minus Memphis.	Remarks.
October, 1873	3′.95	4′.05	4′.0	2′.9	1′.1	No swamp discharge.
November, 1873	13′.8	12′.4	13′.1	8′.4	4′.7	Do.
January, 1874	12′.9	13′.5	13′.2	8′.6	4′.6	Do.
January, 1873	24′.0	23′.0	23′.5	18′.2	5′.3	Do.
December, 1873	34′.48	33′.50	34′.0	27′.8	6′.2	Do.
March, 1874	45′.0	42′.4	43′.7	34′.4	9′.3	Large swamp discharge.
May, 1874	48′.37	45′.82	47′.1	35′.0	12′.1	Do.

These are plotted on same figure, and give a *curve* below line of overflow, whereas the stages taken in 1881 and 1882 seemed to give a straight line below the line of overflow. The curves show, however, that for a given stage at Cairo and Helena the stage at Memphis has lowered about 2 feet since 1874. It will be noticed that the two curves come together at a 47 to 48 foot stage at Cairo and Helena. This stage gives a general overflow of the Saint Francis bottoms, which acts as an equalizer on the slope from Cairo to Helena, and therefore the Commerce Cut-off does not affect it.

By continuing the curve above the point of overflow, with the same bearing as it has below this point, we get the effect of the overflow into the Saint Francis in depressing the river surface at Memphis.

According to this the river was 3.3 feet lower at Memphis than it would have been if no water had escaped into the Saint Francis. This, however, is for a mean stage at Cairo and Helena of 50 feet. If the water had been confined to the channel from Cairo to Helena, the stage would have been much higher at each point, and each about the same height, and the stage at Memphis correspondingly increased. This should be studied in connection with other gauges between Cairo and Helena. I have not had time to pursue this subject farther.

As to the sources of the flood, the curves plotted show that it must have been from the Ohio, White, and Arkansas, together with the Saint Francis and Yazoo. The stage at Saint Louis was very low until February 19, when it rose 16 feet in two days—a rise wholly unprecedented, I believe, for this locality. It went down immediately, however, and did not contribute much to the flood. The White and Arkansas rivers rose at the same time from an 8-foot stage to a 31 and 26 foot stage respectively, reaching their maximum discharge about February 26. These latter were the direct cause of the breaking of the levees in the vicinity of their mouths and below, for the second Helena rise did not reach that locality till about ten days later. Most all the levees in this vicinity broke February 28 and March 1, whereas the second Helena rise did not arrive till March 5 to 8.

I have not investigated for the sources of the flood above Cairo on the Ohio.

The effects of the large breaks on the Yazoo front are very marked on the gauge curves, both above and below. The break at Riverton occurred March 1, and that at Bolivar February 28; the former between the mouths of White and Arkansas, and the latter 26 miles farther down. The fall on the Arkansas City gauge, 30 miles below Bolivar, on November 1 was 1 foot, and the gauge at the mouth of White River 0.4 foot, where each had been rising 0.2 per day. This was wholly due to the two Bolivar breaks. These breaks are almost exactly midway between these two gauges. The effect on the lower gauge was three times as much as that on the upper gauge. (See gauge curves, Plate I.) There were no other breaks on that day below White River except on Catfish Point, a series of small breaks, discharging only about 10,000 cubic feet. The break at Mound Place had occurred February 19, so it does not enter as a new cause on the 28th–29th. The Bolivar breaks, therefore, seem to be alone responsible for these two sudden changes of stage, with the above result. The total fall in five days, February 28 to March 4, at Arkansas City was 1.6 feet, while at mouth of White River it was but 0.9 foot, and this with the Riverton break, 3 miles below White River, discharging about 100,000 cubic feet, which broke March 1.

The reason of this is probably, that at White River the Arkansas swamps were, at this stage, a part of the river reservoir, and a given outlet would not lower the river so much as it would at Arkansas City, where the channel limits were well defined.

Another well marked case is in the Point Lookout, Lake Providence, and Vicksburg curves, on March 21, where the sudden fall is the result of the Alsatia breaks on the Louisiana side at 4 a. m. of that day. I visited these breaks at 10 a. m. on the 21st, and I estimated then that there was a mile of levee gone. This levee was built in the summer of 1881, the upper portion being about 15 feet high, but on the night of the 20th the water had gone over the whole of it, and would have washed the levee out for many miles had not the breaks relieved it. At 10 a. m. the river had fallen 2 feet at the levee, which was about a quarter of a mile or less from the river bank, and no obstructions intervening. The depth of water in front of the upper breaks was 14 feet. The velocity through these breaks, as the water approached the line of the levee, was about 10 feet per second. The fall through the levee was 7 feet. I could not make any very accurate observations, as it was dangerous to go near them in a skiff. I walked down the levee to the first one and got these estimates:

The discharge, however, was about 100,000 cubic feet per second; the fall at Point Lookout, 10 miles above, was 1.6 feet in one day; at Lake Providence, 21 miles above, it was 1 foot in one day; at Vicksburg, 40 miles below, the fall was 0.5 foot in one day; at all these points the river had been rising uniformly about 0.1 foot per day. (See curves, Plate I.)

It is unfortunate that none of these large breaks occurred in the near vicinity of an observation party. As it is, no data has been obtained bearing directly on the checking of the current and corresponding shoaling up below a large outlet. The breaks at Riverton and Bolivar and those in Thompson Bend, below Alsatia, furnish the finest opportunities for such investigations, above Vicksburg.

The surveys made last winter could hardly be taken as the status just previous to the breaks, for the long continued high water had doubtless materially changed the river-bed at most all points, since the soundings were taken. The results of the observation parties, however, should be studied in this connection.

HEIGHT OF FLOOD FOR A CONFINED CHANNEL.

From a careful study of the plotted gauge curves (Plates I and II), one can form some idea of the probable height of the flood if it had been confined by levees from Cairo down. It is seen from Plate II, Fig. 1, that the November-December rise, which came nearly to the top of the bank, passed from Cairo to Vicksburg, with slight addition of volume from White and Arkansas rivers, and a corresponding additional stage of 1 to 2 feet below these rivers. Using this wave as an argument, we may say that a higher wave, had it been equally confined and correspondingly increased from the White and Arkansas, as this flood was, it would have followed the same course.

Assuming that a confined channel at Cairo would have raised the river there 3 feet, which is Humphreys and Abbot's estimate, we may use the stage of 55 feet as our initial wave and now follow its course down the river. When we consider that this flood was largely increased at maximum stage by the local rainfall below Cairo, we may say that the natural drainage of the Saint Francis would have made at least as high a stage at Helena as at Cairo. This would raise the water at Helena from a 47 to a 55 foot stage—an increase of 8 feet.

From the curve on Plate II, Fig. 2, showing relation of Memphis stage to Cairo and Helena, we would have a stage 12 feet less at Memphis or a 43-foot stage, which would be an increase over this flood of 7 feet.

From the gauge curves for White and Arkansas rivers, Plate I, we see that a large volume of water was added to the Mississippi at the height of the flood. The No-

vember rise of 8 feet in the Arkansas, Plate I, caused the November rise at mouth of White River to be 2 feet higher than at Helena. The great rises of 17 and 24 feet in the Arkansas and White rivers respectively, at the top of the flood, would, I think, have raised the river there at least 3 feet. Allowing for a flattening out of the flood wave of 1 foot from Helena down to White River, we would have a 57-foot stage here, where there was but a 48-foot, an increase, therefore, of 9 feet.

The Yazoo natural discharge would have again added to the flood at nearly its maximum, and therefore probably kept the stage up to 57 feet at that point, making an increase there of 7 feet. It will be seen the December rise was nearly the same at White River and Vicksburg. At Lake Providence, the top of the December rise was 8 feet below that at White River and Vicksburg. If we say it would have been four feet lower for the highest flood, it would have given a 53-foot stage, whereas the highest stage reached was 42 feet, an increase, therefore, of 11 feet.

From this line of argument, therefore, I conclude, that the probable increased height of this flood for the Yazoo Front for a river completely leveed below Cairo, would be something about as follows: Memphis, 7 feet; Helena, 8 feet; mouth of White River, 9 feet; Arkansas City, 9 feet; Lake Providence, 11 feet; Vicksburg, 7 feet.

All this, it must be remembered, is for an assumed stage of 55 feet at Cairo and a confined channel from there down. My impression is, however, that for a confined river at Cairo, the increased rise for this flood would have been greater than 3 feet. It is of course very probable that these excessive stages would gradually be diminished as successive floods which ordinarily caused general overflow, were confined to the channel, thereby increasing, in the course of years, the discharging capacity of the river.

It is also well known that if the river had been confined below Cairo the front part of the flood-wave would have been safely transported to the Gulf, instead of being impounded in the swamps, to be poured back into the channel at the highest stage. The discharge per second would in this case not have reached the proportions attained this year. But if the Yazoo and the Tensas bottoms should be leveed out and the Saint Francis left open for a long high stage at Cairo the effect would be the same as it was in this flood, and the volume of water escaping from the river channel per second into the Yazoo and Tensas bottoms should be added to what passed in the channel to find the amount the channel would have carried per second if no water had escaped, allowance being made for an increased velocity for a higher stage.

The results obtained by the observation parties at Columbus, Helena, Lake Providence, and Red River should furnish data which, when combined with the flood discharge which has passed by these stations, would enable one to reach this subject from another direction.

The observation party will determine:

(1) The area of cross-section at maximum stage; (2) the mean velocity at maximum stage; (3) the increment of mean velocity for each foot rise; (4) the rate of scour on section for each foot rise.

Knowing the area and mean velocity, we, of course, have the discharge. Then, if—

A=area of cross-section at maximum stage;
v=mean velocity at maximum stage;
Q=discharge in cubic feet per second at maximum stage;
A'=new area of cross-section for confined channel;
v'=mean velocity for confined channel;
Q'=discharge for confined channel;
w=width of section for confined channel;
i=increment of mean velocity per foot rise;
r=rate of scour on section per foot rise in square feet;
$\triangle h$=additional height for confined channel,

we have—

$$Q=Av \qquad Q'=A'v' \qquad v'=v+i\triangle h \qquad A'=A+\triangle hw+hr.$$

Therefore,

$$Q'=Av'=(A+w\triangle h+r\triangle h)\ (v+i\triangle h)=Av+vw\triangle h+vr\triangle h+Ai\triangle h+iw\triangle h+ir\triangle h^2.$$

But $Av=Q$. Transposing the terms in $\triangle h$ and dividing by the coefficient of $\triangle h^2$, we have—

$$\triangle h^2+\triangle h\left(\frac{vw}{ir}+\frac{v}{i}+\frac{A+w}{r}\right)=\frac{Q'-Q}{ir}$$

From which we get—

$$\triangle h=\sqrt{\frac{Q'-Q}{ir}+\frac{1}{4}\left(\frac{vw}{ir}+\frac{w}{i}+\frac{A+r}{r}\right)^2}-\frac{1}{2}\left(\frac{vw}{ir}+\frac{A+w}{r}\right)$$

In which the only unknown quantities are Q′ and $\triangle h$. If the swamp discharge past the station, or rather the amount escaping from the river above the station, is approximately known, this is Q′— Q; and $\triangle h$ becomes known.

The only data available now for such a computation of this flood are those obtained at Red River Landing, and here we have but the field computations. Taking these, however, and applying this formula to the facts found there, we can at least indicate a method which, I think, may be found of some importance.

To find the rate of scour on the section there has been subtracted from the daily observed areas the area due to increased stage, and the remainder gave the daily scour. The continued summation of these quantities from December 16 to March 31 gave the total scour from the initial date, which was plotted in connection with the gauge reading on Plate IV, Fig. 3. The rate of scour seems to change with the stage, so the mean line is evidently a curve. Assuming, however, that the rate remains constant above 45 feet, and drawing a tangent to the curve at this upper portion (see red dotted line on sheet), we obtain the probable rate of scour for this stage of the river. This is 2,300 square feet per foot rise. The rate of increase of mean velocity was obtained in a similar manner, and was found to be 0.1015 foot per foot rise. The maximum discharge was 1,600,000 cubic feet per second. I think that the entire discharge across the latitude of Red River was about 2,200,000 cubic feet.

The area of cross-section at maximum discharge was 235,360 square feet; the width was 3,900 feet; the stage was 48.32 feet; the mean velocity was 6.78 feet per second. We have, then, for Red River Landing—

$$Q = 1{,}600{,}000;\ Q' = 2{,}200{,}000;\ A = 235{,}360;\ v = 6.78 \text{ feet};\ w = 3{,}900 \text{ feet};$$
$$h = 48.32 \text{ feet};\ i = 0.1 \text{ foot};\ r = 2{,}300 \text{ square feet}.$$

From which, according to the above formula—

$$\triangle h = 9 \text{ feet}.$$

This is for a confined channel, with the Atchafalaya closed, and the most uncertain element in the problem is whether or not the scour would have continued at the same rate for this increase of stage. If the rate of scour should increase with a higher stage, the increase of flood height here would be less than nine feet. If the rate should continue as it is here used, the total increase of scour for this additional 9-feet rise would be $9 \times 2{,}333 = 21{,}000$ sq. feet. The width being 3,900 feet, this would give a scour over the entire cross-section of about six feet. It is probable, however, that the scour would not extend over more than 3,000 feet, which would give a scour of seven feet. The increase of velocity would be $6'.78 + (9 \times 0.) = 7'.68$ per second $= 5.23$ miles per hour.

The result, therefore, of turning all the river down the Mississippi below Red River, and confining it to the channel, would appear to have been for this flood:

An increase of stage of nine feet; a scour of bed of seven feet; an increase of mean velocity of 0.9 feet.

Such a line of argument could evidently be followed at every point where an observation party has been located.

Most of the results given in the latter part of this report are only supposed to be approximate, and are given rather as indicating a method of approaching some problems than as furnishing their solution.

The total discharge of 2,200,000 cubic feet per second at Red River is only assumed as an extreme limit, and is probably much larger than would have been found at any locality for this flood for a confined channel. It was only taken to show what the argument would lead to for a very extreme case.

Without entering into any discussion of the question, I wish here to state that my judgment is that the most efficient means of passing a large flood from Cairo to the Gulf, with a minimum stage, is by means of cut-offs, judiciously made. I think it is a mistake to say that the result of a cut-off is to raise the stage of water below. After the first rush of water, which gives an *increased discharge* below, I see no reason why the stage below should be raised. I think experiments might be made on a small scale, which would throw considerable light on this question.

Very respectfully, your obedient servant,

J. B. JOHNSON,
United States Assistant Engineer.

First Lieut. SMITH S. LEACH,
Secretary Mississippi River Commission.

Discharge of outlets from Mississippi into the Yazoo Bottom.

Locality.	Kind of outlet.	Date of break.	Date of observation.	Stage of water below maximum.	Width.	Mean depth.	Surface velocity per second.	Discharge per second.	Partial summation of discharge.	Combined summation of discharge.
				Feet.	*Feet.*	*Feet.*	*Feet.*	*Cubic feet.*		
1. South Horn Lake	Crevasse*	Mar. 5	Mar. 13	0.5	150	3	3	945	945	
2. Harklerhodes to Star Landing, 35 miles	Over bank†	Jan. 20	Mar. 14	0.5	5,000	2	1.5	10,500		
	Do	Jan. 20	Mar. 14	0.5	2,300	3	1.5	7,245		
	Do	Jan. 20	Mar. 14	0.5	1,000	1.5	1	1,050		
	Do	Jan. 20	Mar. 14	0.5	1,000	1.5	2	2,100		
					9,300				20,895	21,840
3. Commerce to Mhoon's Landing, 10 miles	Crevasse‡	Mar. 5	Mar. 14	0.5	600	3.5	2	2,940		
	Do	Mar. 5	Mar. 14	0.5	120	5	4.5	1,890		
	Do	Mar. 5	Mar. 14	0.5	240	4	3.5	2,350		
	Over levee	Mar. 5	Mar. 14	0.5	450	1	3.5	1,100		
	Do	Mar. 5	Mar. 14	0.5	120	1	3.5	300		
	Do	Mar. 5	Mar. 14	0.5	80	1	4.5	250		
	Do	Mar. 5	Mar. 14	0.5	100	1	3.5	245		
	Do	Mar. 5	Mar. 14	0.5	2,600	0.5	4	3,640		
	Crevasse	Mar. 5	Mar. 14	0.5	60	3	4.5	570		
	Do	Mar. 5	Mar. 14	0.5	200	3	5	2,100		
	Do	Feb. 12	Mar. 14	0.5	900	3	5	9,450		
	Do	Feb. 12	Mar. 14	0.5	200	4	5	2,800		
	Do	Mar. 5	Mar. 14	0.5	150	5	5	2,550		
	Do	Mar. 5	Mar. 14	0.5	150	4	5	2,100		
	Do	Mar. 5	Mar. 14	0.5	100	5	5	1,750		
	Do	Mar. 5	Mar. 14	0.5	50	3	5	525		
	Do	Mar. 5	Mar. 14	0.5	150	3	5	1,575		
	Do	Mar. 5	Mar. 14	0.5	500	3.5	5	6,125		
	Do	Mar. 5	Mar. 14	0.5	120	6	6	3,020		
	Do	Mar. 5	Mar. 14	0.5	75	2	4	420		
	Do	Feb. 12	Mar. 14	0.5	300	9	3	5,670		
	Do	Feb 12	Mar. 14	0.5	200	8	3	3,360		
4. In vicinity of Mhoon's Landing	Crevasse	Feb. 12	Mar. 14	0.5	30	6	3	380		
	Do	Feb. 12	Mar. 14	0.5	900	7	3.5	15,435		
	Do	Feb. 12	Mar. 14	0.5	2,100	8.5	3.5	43,730		
	Do	Feb. 12	Mar. 14	0.5	260	8	6	8,870		

	Do	Feb. 12	Mar. 14	0.5	165	3	3	1,040		
					11,510				124,185	146,025
5. Mhoon's Landing to McKinney Bayou, 7 miles (flow back to river).	Over levee§	Feb. 16	Mar. 15	0.4	2,500	0.5	1.5	1,310		
	Do	Feb. 16	Mar. 15	0.4	2,500	1	2	3,500		
	Crevasse	Feb. 16	Mar. 15	0.4	660	5	3	6,930		
	Over levee	Feb. 16	Mar. 15	0.4	1,600	1	2	2,240		
	Do	Feb. 16	Mar. 15	0.4	500	2	3	2,100		
	Do	Feb. 16	Mar. 15	0.4	660	1	2	920		
	Crevasse	Feb. 16	Mar. 15	0.4	500	5	3	5,250		
	Do	Feb. 16	Mar. 15	0.4	660	2.5	5	5,500		
	Do	Feb. 16	Mar. 15	0.4	330	3	5	3,400		
	Overflow	Feb. 16	Mar. 15	0.4	330	1	4	920		
	Over levee	Feb. 16	Mar. 15	0.4	330	1	2	460		
	Do	Feb. 16	Mar. 15	0.4	500	1	2	700		
	Do	Feb. 16	Mar. 15	0.4	660	1	1	460		
	Do	Feb. 16	Mar. 15	0.4	330	1	3	700		
	Crevasse	Feb. 16	Mar. 15	0.4	165	2	5	1,150		
	Do	Feb. 16	Mar. 15	0.4	165	3	5	1,730		
	Do	Feb. 16	Mar. 15	0.4	660	2	3	2,770		
	Do	Feb. 16	Mar. 15	0.4	500	3	6	6,300		
	Over levee	Feb. 16	Mar. 15	0.4	660	1	3	1,400		
	Crevasse	Feb. 16	Mar. 15	0.4	330	2	3	1,400		
	Over levee	Feb. 16	Mar 15	0.4	330	1	3	700		
	Crevasse	Feb. 16	Mar. 15	0.4	330	2	3	1,400		
	Over levee	Feb. 16	Mar. 15	0.4	330	1	3	700		
	Do	Feb. 16	Mar. 15	0.4	660	1	3	1,400		
	Crevasse	Feb. 16	Mar. 15	0.4	165	2	3	700		
6. McKinney Bayou	Crevasse	Feb. 18	Mar. 15	1.1	324	13	3.5	10,320		
					16,680				−64,360	81,665
7. McKinney Bayou to Austin (2½ miles)	Over levee	Feb. 14	Mar. 5	1.1	660	1	1	460		
	Crevasse	Feb. 14	Mar. 5	1.1	310	‖32	2.25	10,400		
	Over levee	Feb. 14	Mar. 5	1.1	330	1	2	460		
	Do	Feb. 14	Mar. 5	1.1	330	1	1.5	350		
	Do	Feb. 14	Mar. 5	1.1	330	1	3	700		
(Flow from river)	Crevasse	Feb. 17	Mar. 5	1.1	412	‖27	3	15,600		
	Over levee	Feb. 14	Mar. 5	1.1	330	1	1	230		

* Data obtained of J. P. Thurman, of Norfolk Landing.

† Water has been escaping over this bank since January 25, the stage at Memphis having varied but 2 feet since then.

‡ These breaks commence about 3 miles below Commerce, and continue to about three-quarters of a mile below Mhoon's. Depth of overflow on cultivated fields back of Mhoon's, about 8 feet.

§ The overflow from 2 miles below Mhoon's to McKinney Bayou is back into river. It will be seen, comparing amounts, that the water that flows back to the river above McKinney Bayou all went in above Mhoon's Landing.

‖ Only two-thirds of these sections considered available for discharge; the rest is eddy. Greatest depth is 48 feet.

Discharge of outlets from Mississippi into the Yazoo Bottom—Continued.

Locality.	Kind of outlet.	Date of break.	Date of observation.	Stage of water below maximum.	Width.	Mean depth.	Surface velocity per second.	Discharge per second.	Partial summation of discharge.	Combined summation of discharge.
				Feet.	*Feet.*	*Feet.*	*Feet.*	*Cubic feet.*		
7 McKinney Bayou to Austin (2½ miles)—Continued ...	Crevasse	Mar. 5	Mar. 5	1.1	360	*15	3	11,340		
Flow from river—Continued.	Do	Mar. 5	Mar. 5	1.1	115	2	5	800		
					3,177				40,340	122,005
8. Austin to Glendale (20 miles)	Crevasse	Mar. 5	Mar. 16	1.2	500	2	2	1,400		
	Do	Mar. 5	Mar. 16	1.2	260	4	3	2,170		
	Do	Mar. 5	Mar. 16	1.2	60	4	4	660		
	Do	Mar. 5	Mar. 16	1.2	80	6	4	1,340		
	Do	Mar. 5	Mar. 16	1.2	50	5	2	350		
9. Back of Sunflower Lake	Crevasse	Mar. 5	Mar. 16	1.2	50	3	4	420		
	Do	Mar. 5	Mar. 16	1.2	725	†47	2	47,770		
	Do	Mar. 5	Mar. 16	1.2	.....	30	3			
	Do	Mar. 5	Mar. 16	1.2	330	10	3	6,930		
	Do	Mar. 5	Mar. 16	1.2	75	12	2	1,260		
	Do	Mar. 5	Mar. 16	1.2	1,650	2	1	2,300		
	Do	Mar. 5	Mar. 16	1.2	130	8	2	1,470		
	Do	Mar. 5	Mar. 16	1.2	60	6	2	550		
	Do	Mar. 5	Mar. 16	1.2	100	12	2	1,680		
	Over levee	Feb. 10	Mar. 16	1.2	1,000	1	2	1,400		
	Crevasse	Feb. 10	Mar. 16	1.2	200	6	4	3,360		
	Over levee	Feb. 10	Mar. 16	1.2	660	1	1.5	700		
	Crevasse	Feb. 10	Mar. 16	1.2	200	10	4	5,600		
	Do	Feb. 10	Mar. 16	1.2	230	9	3	4,350		
	Over levee	Feb. 10	Mar. 16	1.2	1,000	1	1	700		
	Crevasse	Feb. 10	Mar. 16	1.2	330	5	6	6,930		
	Do	Feb. 10	Mar. 16	1.2	660	3	3	4,160		
	Do	Feb. 10	Mar. 16	1.2	330	2	3	1,390		
	Do	Feb. 10	Mar. 16	1.2	165	16	1	1,850		
	Over levee	Feb. 10	Mar. 16	1.2	330	1	2	460		
	Do	Feb. 10	Mar. 16	1.2	330	1	1	230		
	Crevasse	Feb. 10	Mar. 16	1.2	330	3	2	1,400		
	Do	Feb. 10	Mar. 16	1.2	165	32	1	3,700		
	Over levee	Feb. 10	Mar. 16	1.2	330	1	4	920		
	Do	Feb. 10	Mar. 16	1.2	330	1	1	230		
	Crevasse	Feb. 10	Mar. 16	1.2	165	4	5	2,310		
	Over levee	Feb. 10	Mar. 16	1.2	1,320	2	4	7,400		

	Do	Feb. 10	Mar. 16	1.2	1,320	2	4	7,400			
	Do	Feb. 10	Mar. 16	1.2	100	10	6	4,200			
10. Trotter's Landing	Crevasse	Jan. 15	Mar. 16	1.2	700	10	4	19,600			
	Levee caved off in December.	Feb. 10	Mar. 16	1.2	330	1	3	†700			
	Over levee	Feb. 10	Mar. 16	1.2	200	2	3	†840			
	Do	Feb. 10	Mar. 16	1.2	165	2	4	†920			
	Do	Feb. 10	Mar. 16	1.2	200	1	3	†420			
11. *Just above railroad*	Crevasse	Feb. 10	Mar. 16	1.2	260	25	4	†18,200			
					15,420				167,670	289,675	
12. Glendale to foot Island 64 (85 miles)	Two crevasses	Mar. 6	Mar. 17	1.2	700	5	6	14,700			
	Crevasse	Feb. 12	Mar. 17	1.1	660	11	8	§40,650			
	Do	Feb. 9	Mar. 17	1.1	300	10	6	12,600			
13. 6 miles below Friar's Point	Crevasse	Feb. 10	Mar. 17	1.1	2,000	4	5	28,000			
	Do	Feb. 10	Mar. 17	1.1	65	6	4	550			
	Do	Feb. 10	Mar. 17	1.1	660	6	2	11,100			
	Do	Feb. 10	Mar. 17	1.1	330	4	4	3,700			
	Do	Feb. 10	Mar. 17	1.1	660	4	4	7,400			
14. Opposite Island No. 63	Crevasse	Feb. 10	Mar. 17	1.1	330	2	3	1,400			
	Do	Feb. 10	Mar. 17	1.1	660	4	4	7,400			
	Do	Feb. 10	Mar. 17	1.1	330	4	4	3,700			
	Do	Feb. 10	Mar 17	1.1	330	4	4	3,700			
	Do	Feb. 10	Mar. 17	1.1	990	4	3	8,320			
	Do	Feb. 10	Mar. 17	1.1	330	4	4	3,700			
	Do	Feb. 10	Mar. 17	1.1	65	6	2	550			
	Do	Feb. 10	Mar. 17	1.1	330	3	2	1,400			
	Do	Feb. 10	Mar. 17	1.1	330	4	3	2,770			
	Do	Feb. 10	Mar. 17	1.1	500	4	3	4,200			
	Do	Feb. 10	Mar. 17	1.1	500	2	6	4,200			
	Do	Old br'k.	Mar. 17	1.1	400	9	3	7,560			
15. Bland's Bayou (old break)	Levee caved off	Old br'k.	Mar. 17	1.1	3,300	4	1	9,240			
					13,070				176,840	466,515	
16. Above Sunflower Landing	Crevasse	Old br'k.	Mar. 18	1.2	20	3	3	‖400			
	Over bank	Old br'k.	Mar. 18	1.2	10,500	5	1	36,750			
					10,520				37,150	429,365	
17. Sunflower to mouth of White River	Crevasse	Mar. 5	Mar. 18	1.2	330	4	3	4,160			
18. Lake Charles	Crevasse	Mar. 5	Mar. 18	1.2	580	4	3	3,640			
	Do	Mar. 5	Mar. 18	1.2	80	4	3	520			
	Do	Mar. 12	Mar. 18	1.2	600	5	3	6,300			
19. Pashmataha	Crevasse	Mar. 12	Mar. 18	1 2	165	5	2	1,150			

*Fall through levee, 2.1 feet.

†Sounded two sections. Mean of one, 47 feet; mean of other, 30 feet. The velocity on deep sec. = 2 feet. The velocity on 30-foot sec. = 3 feet. Levees, 50 feet from Sunflower Lake. A deep gorge cut out clear from lake. Deepest water, 60 feet.

‡These breaks on Thompson place below Glendale. Data obtained from Captain Stancell, of Helena, levee contractor.

§This break 1½ mile above Delta. Fall through levee, 30 inches; velocity so rapid could not go near it with skiff. Average depth where soundings could be taken was 11 feet.

‖Levee caved off for 2 miles above Sunflower. Flow back to river.

Discharge of outlets from Mississippi into the Yazoo Bottom—Continued.

Locality.	Kind of outlet.	Date of break.	Date of observation.	Stage of water below maximum.	Width.	Mean depth.	Surface velocity per second.	Discharge per second.	Partial summation of discharge.	Combined summation of discharge.
					Feet.	*Feet.*	*Feet.*	*Cubic feet.*		
19. Pashmataha—Continued	Crevasse	Feb. 28	Mar. 18	1.2	400	24	6	*40,320		
20. Concordia	Crevasse	Feb. 28	Mar. 18	1.2	165	6	4	2,800		
					2,320				58,890	488,255
21. Riverton break	Crevasse†	Mar. 1	Mar. 18	1.2	1,100	31	4.5	107,400	107,400	595,655
	Do	Mar. 1	Mar. 18	1.2	500	4	4	5,600		
22. Riverton to Prentiss (8 miles)	9 crevasses	Mar. 1	Mar. 18	1.2	1,525	4	3	12,810		
23. At Hughes	Crevasse	Mar. 1	Mar. 18	1.2	660	5	6	13,860		
					3,785				32,270	627,925
24. Just above Bolivar	Crevasse	Feb. 28	Mar. 19	2.2	550	39	2.5	‡37,530		
25. Just below Bolivar	Crevasse	Feb. 28	Mar. 19	2.2	600	14	6	35,280		
	Do	Feb. 28	Mar. 19	2.2	1,320	12	5	55,440		
					2,470				128,250	756,175
26. On Catfish Point	do	Feb. 28	Mar. 19	2.2	330	4	4	3,500		
	2 crevasses	Feb. 28	Mar. 19	2.2	330	5	2	2,310		
					660				5,810	761,985
(Flow black to river since March 13)	Crevasse	Feb. 28	Mar. 19	2.2	200	3	2	840	840	761,145
72. At Mound Place	Crevasse	Feb. 19	Mar. 19	2.2	410	18	4	20,660	20,660	781,805

* Levee here crosses Concordia Bayou. Soundings on line of levees as great as 48 feet. Depth of water in bayou 28′.
† A gorge cut out from river bank clear through levee.
‡ These two are one break. The deep section is where levee broke before. Deepest soundings 48 feet in deep section.

2.—Saint Francis front, for the flood of 1882.

(By Hunter Stewart, United States Assistant Engineer.)

Saint Louis, Mo., *July* 25, 1882.

Sir: I have the honor to submit herewith my report on the examination of the inundation of the Saint Francis front, made in accordance with your instructions of March 7, 1882.

Very respectfully, your obedient servant,

HUNTER STEWART,
United States Assistant Engineer.

First Lieut. Smith S. Leach,
Secretary Mississippi River Commission,
No. 2828 Washington avenue, Saint Louis, Mo.

JOURNAL.

The party left Saint Louis at 2 p. m., on March 7, 1882. on board of the steamer R. J. Wheeler, which had been assigned to them. Commerce, Mo., the upper limit of the front of the Mississippi River that is tributary to the Saint Francis Bottom, was passed at 12.30 p. m. on March 8. The banks of the river between Commerce and Dog-Tooth Island were either altogether out of water or barely covered. When the Missouri Sister Island was reached some overflow was found, but the water of the same was slack. The current in the Mississippi River itself slackened considerably as Cairo was approached. Some twelve examinations were made in the 12 miles between Able's Point and Cairo, but no current of any importance was found, the little that there was, 6 to 8 feet per minute, being generally either parallel with or towards the river. Cairo was reached on the evening of the 8th. On the morning of the 9th we left Cairo at 7.30 a. m., proceeding down the river. The bank of Bird's Point was exposed. We went as far as Norfolk, Mo., finding but slight current, and that was generally in the direction of the river. At 10 a. m., the rain having ceased, the wind rose and became so high as to affect the surface velocity to such an extent as to render the indications of the log unreliable. The storm continuing all day no more work was done. On March 10 the right bank was examined from Norfolk, Mo. to Point Pleasant, Mo. The New Madrid Ridge was uncovered, although it had been submerged, and a great amount of water was returning to the river between it and Donaldson's Point.

On March 11 the right bank was examined from Point Pleasant to Daniel's Point, the greater part of this stretch being submerged, and on the left bank current observations were made at the mouths of the Obion, the Upper and Lower Forked-Deer rivers.

March 12. In the morning the right bank was examined from Daniel's Point to Osceola, Ark.; arrived at Plum Point at 8.30 a. m.; left at 2.30 p. m.; the steamer R. J. Wheeler having been used during this interval in getting ready the outfit for the reconnaissance of the Saint Francis Bottom by Assistant Engineer E. S. Davis, who had come aboard at Cairo. During the afternoon of the 12th the right bank was examined from Osceola to the upper portion of the bend of Island No. 35.

March 13. The right bank was followed closely, through the bend of Island No. 32, McGavock's Chute, the bend of Island No. 37, Devil's Elbow Bend, Fogelman's Chute, Beef Island Bend, Redman's Point, up the chute of the Chicken Island, back again, and thence to Hopefield. Memphis was reached at 1.30 p. m.; instructions were telegraphed for, and reply arrived at 9 p. m.

March 14. The right bank was examined from Hopefield to the lower end of Commerce Cut-off, including Council Bend.

March 15. The right bank was examined from Commerce Cut-off to the upper end of Saint Francis Island. I proceeded thence to Helena, and telegraphed for instructions; returned to the upper end of Saint Francis Island, examining the bank on the up-trip, finishing reconnaissance, and returned to Helena.

THE MODE OF OBSERVING.

The steamer kept as close to the right bank of the river as the nature of the shore would permit. Observations were made in a skiff, which had to be carried aboard in order to prevent its swamping. When it had been decided to take an observation the steamer would slacken speed and reverse her engines, the skiff would be launched, and the observing party push out to the shore. When this was reached the skiff was made

fast, a sounding taken, and the surface velocity measured by means of the log, and its direction with a prismatic compass. The skiff was then cast loose and rowed some distance over the bank, the leadsman taking soundings, and if any marked change in depth was found, a greater distance would be sounded and the mean of the soundings recorded. The steamer in the meanwhile would stem the current with her head down-stream, or, if that were impossible on account of the wind or the great velocity of the current, she would round-to after the skiff was launched and would again round-to when the latter put out from shore, so as to be ready to proceed down-stream as soon as the skiff was hauled aboard.

Whenever the banks were submerged for a great distance, which was generally the case, and they could be seen from the boat, an observation would be made after a five minutes' run, that being the estimated length of time required for the Wheeler to go a mile down-stream. This would sometimes be varied by the observer watching from aboard the steamer the direction and velocity of the current over the bank as shown by the break of the water against the timber, and selecting localities for observation where it appeared to him to be a mean for a given stretch; he estimating what proportion of the distance between two observations should be applied to each.

Where submerged and exposed banks alternated, the depth and velocity of the surface water would be measured as above, the length of the overflowed bank would be estimated, and the location of the point of observation and limits of overflow noted, the distances being afterwards taken off of the detail charts in the office.

In the case of open streams a cross-section would be sounded, the soundings being placed approximately equidistant, and the surface velocity measured, where possible; otherwise it would be estimated.

The locality of the observation was in every instance noted, and as soon as the observer returned to the steamer, plotted as closely as possible from the information given by the pilots and the character of the topography—Major Suter's reconnaissance was used between Cairo and Memphis and between Commerce Cut-off and Helena, and General Comstock's detail charts between Memphis and Commerce Cut-off.

The river bank proper, in contradistinction to the artificial bank or levee, was examined throughout, and no effort was made to follow the latter, as neither a greater nor a less amount of water than the net escape over the bank could get into the back country. It is evident that, providing the examination of the movement of the water on the bank was correctly and accurately made, the results of such a method would be the same as those obtained from a correct and accurate examination of the line of levees. Even supposing that there is a greater probability of error on the former than in the latter method, still the increased accuracy that would have resulted from following the remnants of the levees, being such a small percentage of the total amount, would not have justified the use of the greater length of time that would have been required.

For in the length of river front included in the right bank between Commerce, Mo., and Helena, Ark., the system of levees is very imperfect, the percentage of unleveed bank being very large, and, as by far the greater part of the total amount of outflow and inflow occurs over the latter portion, it would have been necessary to apply to it the same method of observation as was used over the entire stretch. Moreover, where there were levees, they would virtually exclude a correrponding length of river front from the computation, either by deflecting the current of the overflow so as to cause its direction to become parallel with that of the river, or by checking it so as to render the intervening water slack.

REDUCTION.

As the examination was made after the crest of the flood-wave had passed, the discharge obtained from the observations had to be corrected for difference of stage in order to estimate the discharge at the maximum and at the mean flood stage. The data obtained were crude in their nature, and no attempt at a very refined reduction of them has been made; but when a method had been decided upon, it was rigorously carried out in order to secure accuracy of computation. This fact will account for the seemingly unwarranted exactness of the tabulated results.

The following formulæ were used in computing discharge:

For observation stage—

$$Q = V \times W \times S \times C;$$

wherein—

V = surface velocity.
W = width of cross-section.
S = sounding.
C = coefficient of reduction, which is the product of the coefficient to convert surface velocity into mean velocity, and the coefficient to correct cross-section area for obstructions.

For maximum stage—

$$Q = V \times W \times D \times C$$

wherein—

V, W, and C are the same as above.
D = computed depth at highest stage.

For mean flood stage—

$$Q = V \times W \times D \times C$$

wherein—

V, W, and C are as above.
D = computed depth at mean flood stage.

The reasons for using the above elements of discharge are given further on.

VELOCITY.

Velocity may be regarded as a function of slope and mean depth.

1. Regarded as a function of slope.

It may be premised that, when the swamps are filled, the oscillation of the river is identical with that of the escaping water in its immediate vicinity and the slope remains constant.

The following facts may be quoted in substantiation of the above statement.

The high-water reconnaissance of the Saint Francis Basin, March, 1882, by Assistant Engineer E. S. Davis, shows that the observed water surface and the surface of the highest water, as given by high-water marks, were sensibly parallel.

Observations were made near Commerce, Miss., during the month of February, 1882, to determine the amount of fall in the river that would be necessary to uncover a tract of submerged land which was separated from the river by a strip of exposed land and a levee—the overflow being caused by back-water from breaks in the levee farther down the river. One gauge was placed in front of the levee and another in the overflowed field back of it, and the latter showed a responsive and almost identical change with the former.

Therefore, in so far as velocity is the result of slope, it is just to conclude that the velocity of the water escaping over the banks of the river will remain nearly constant after the movement of the water in the adjacent swamp has reached its normal relation with the river; that approximating equilibrium.

2. Regarded as a function of mean depth.

For a discharging channel an increased mean depth generally produces a decreased ratio of friction to cross-section area and a resulting greater velocity; but, as in the case of inundated lands, where the principal cause of friction is the obstructions in the channel, it is easy to conceive of circumstances, such as the flood reaching the branches of the underbrush or of the timber, where the ratio would increase with the mean depth. Therefore, not only does the velocity of the water escaping over the banks not necessarily increase, but it may diminish with an increased mean depth.

Moreover, if to the measured velocities formulæ were applied which had been deduced from data obtained under conditions varying from those found during the examination, or those probable at a higher or a lower stage, the only result that could be attained would be the certainty of a large probable error with an uncertain sign.

Considering all of these circumstances, it was thought that more accurate results could be obtained, in calculating the discharge for highest and mean stages of the flood, by using those velocities measured at an intermediate stage than any that could be obtained from them by computation.

Therefore the observed velocities were used in all discharge calculations.

MEAN DEPTH.

1. *Observed stage.*—The soundings were used.

2. *Maximum stage.*—The depth obtained by sounding has to be increased by the difference between the stage of water at the time of observing and the highest stage, in order to obtain a depth that can be used in the computation of the discharge for the latter.

The most accurate method of attaining the above would have been to have measured the difference between the two stages at every point of observation, provided reliable high-water marks were obtainable. This could be done but seldom, owing to the indistinctness of the marks on the trees, and on account of the necessary

rapidity of the work, which precluded the possibility of going any distance to get a recorded high-water mark. As the accuracy of the differences measured were, in most cases, considered questionable, and as the number of reliable ones was not sufficient to reduce the work, this method was discarded and recourse taken to the gauge records.

Therefore, the increments to convert soundings to mean depth at high water were obtained graphically, by using the records at the gauge stations. The distances along the river were plotted as horizontal co-ordinates; for that portion between Cairo and Memphis, those given on the charts of the Mississippi River Commission were used; and for the portion between Memphis and Helena, those on the charts of Major Suter's reconnaissance; the difference between the mean gauge reading for the date of examination and the highest gauge reading, at each station, were plotted as vertical co-ordinates; and the resulting points were connected by straight lines—the ordinate, corresponding to its distance from Cairo, giving the increment for any intermediate locality.

This method is, of course, open to the objection that the probable oscillation at a point between two measured oscillations is not necessarily proportionate to the distance; but, in the absence of a better one, it was adopted as giving a sufficiently close approximation.

3. *Mean flood stage.*—The mean flood stage being lower than the observed stage, the depths obtained by sounding have to be decreased by the difference between the stages, in order to compute the discharge at the former. In obtaining this, the zero stage, or that at which the escape of water from the river would practically cease, was determined for each gauge from the depth of overflow at the observed stage: the gauge curve was plotted for the time that the river was continuously above this stage, the area of the included surface was measured with the planimeter and the mean height of the curve determined. This height added to the reading of the zero flood stage gives the mean flood stage. The difference between the mean gauge reading at the examination and that for mean flood stage at each station were clotted, and the decrements which were to be applied to the soundings taken at the former were obtained in the same manner as were the increments for maximum stage.

The following are the readings of the zero flood stage on the gauges: Cairo, 41 feet; Columbus, 95 feet; New Madrid, 37 feet; Cottonwood Point, 32 feet; Fulton, 32 feet; Memphis, 29 feet.

Gauge readings, increment and decrements:

CAIRO.

	Feet.
Highest stage, February 26, 1882.	51.87
Observed stage, March 10, 1882..	47.70
Mean flood stage	46.24
Increment	4.17
Decrement	1.46

COLUMBUS.

Highest stage, February 26, 1882.	102.801
Observed stage, March 10, 1882..	100.243
Mean flood stage	99.14
Increment	2.558
Decrement	1.103

NEW MADRID.

Highest stage, February 27, 1882.	47.5
Observed stage, March 10, 1882..	43.7
Mean flood stage	42.2
Increment	3.8
Decrement	1.5

COTTONWOOD POINT.

Highest stage, February 28, 1882.	37.5
Observed stage, March 11, 1882..	36.3
Mean flood stage	35.62
Increment	1.2
Decrement	0.65

FULTON.

	Feet.
Highest stage, March 1, 1882	36.69
Observed stage, March 12, 1882	36.04
Mean flood stage	35.15
Increment	0.65
Decrement	0.89

MEMPHIS.

Highest stage, March 6 and 9, 1882.	35.15
Observed stage, March 13, 1882	34.70
Mean flood stage	33.4
Increment	0.45
Decrement	1.30

MEMPHIS.

Highest stage, March 6 to 9, 1882.	35.15
Observed stage, March 14, 1882	34.55
Increment	0.60

MHOON'S LANDING.

Highest stage, March 9, 1882	40.80
Observed stage, March 15, 1882	39.95
Increment	0.85

HELENA.

(Mississippi River Commission gauge.)

Highest stage, March 8, 1882	47.10
Observed stage, March 15, 1882	46.20
Increment	0.90

WIDTH OF CROSS-SECTION.

The width of the cross-section, or, in other words, the length of river front which is to be applied to the computed mean depth, is, to a great extent, a question of personal observation and judgment.

The positions of the observations were plotted on the small charts and the distances were taken from the detail ones. Whenever there were no indications to the contrary, one-half of the distance between three consecutive observations was applied to the middle one; otherwise the distances were adjusted as the notes or the memory of the observer dictated.

COEFFICIENTS.

The only velocity measured being that of the surface, a reduction to mean velocity is necessary in order to obtain true discharge. As neither the time nor the appliances were available to determine the relation of surface velocity to the curve of vertical velocities for discharge taking place over the bank of the river, and as no data bearing upon the subject were procurable, the adoption of the coefficients had to be determined arbitrarily. The acknowledged tendency towards exaggeration, in calculating flood discharge from meager data, was the one known fact that has indicated the use of as small a coefficient as was warranted by other hydraulic observations. With this in view the following coefficients were adopted:

For open streams, mean velocity = surface velocity × .8

For crevasses, mean velocity = surface velocity × .72

For discharge over the banks, mean velocity = surface velocity × .72

(.72 being Brüning's smallest coefficient for open channels).

Coefficient for obstructions.—As most of the outflow and inflow was taking place over the banks, and as these were generally covered with vegetation, it is necessary to make a correction of the measured cross-section in order to obtain the area effective for discharge.

From the general nature of the bank, varying from open fields to a thick growth of young cottonwoods, and in view of the large reduction made in calculating mean velocity, a reduction of 10 per cent. of cross-section area appears to be sufficiently large.

Effective area = cross-section area × .9.

For discharge over the bank, we have—

$$Q = V \times .72\ (D \times W) \times .9 = V \times D \times W \times .648,$$

or, discarding the last decimal in favor of the nearer hundredth, we have—

$$Q = V \times D \times W \times C$$

where C = .65.

RESULTS.

From Commerce, Mo., to a point 14 miles below Cairo, there was no escape from the river. At New Madrid, Mo., there was a net escape, at highest stage, of 86,000 and at observed stage of 20,000 cubic feet per second; at mean flood stage there was no escape. These figures reveal the influence of the New Madrid Ridge, which deflected the overflow water and caused its return to the river, and which was in ratio to its total, partial, or non-submergence—most of the return flow occurring between Donaldson's Point and New Madrid.

From the New Madrid Ridge to Helena there was a continuous overflow, with the exception of that portion of the old bank of the river situated between the foot of Island 35 and Fogelman's Chute, the exposure of the left bank in this locality being, in all probability, the result of the many changes which have occurred in the river in its vicinity.

A point opposite Memphis, Tenn., may be regarded as the limit of supply to the Saint Francis Bottom, as a study of the curve of net escape shows but a slight oscillation from there to a point 28 miles below; at this latter place the return flow commences, and, were the movements over points omitted, the curve would show a continuous decline.

We have at Helena: At maximum stage, a virtual balancing of outflow and inflow; at the observed stage, which was below high water, 3.8 feet at New Madrid and 0.9 feet at Helena, an excess of return flow over the bank of 150,000 cubic feet per second, to which 50,000 cubic feet per second, at the least estimate, should be added for overflow water carried by the Saint Francis River, showing that, at the time that the examination was made, the Saint Francis reservoir was being emptied at the rate of 200,000 cubic feet per second.

AT HIGHEST STAGE.

	Cubic feet per second.
Summation of outflow and inflow	2,440,000
Amount of overflow to be returned by the Saint Francis River	63,000
Total movement	2,503,000
Summation of outflow	1,251,000
Maximum net escape on any one latitude	615,000
Saint Francis River:	
Estimated discharge	115,000
Supply from outflow from Mississippi River	63,000
Supply from other sources	52,000

Classification of outlets.

	Cubic feet per second.	Per cent.
Water escaping in bends	860,000	35
Water returning in bends	833,000	33
Water escaping in reaches and over points	372,000	15
Water returning in reaches and over points	420,000	17
	2,485,000	100
Total movement for bends	1,693,000	.....
Total movement for points and reaches	792,000	.....
Approximation discrepancy	18,000	.....
Total movement	2,503,000	.....

	Escape.	Return.
	Per cent.	*Per cent.*
Over the banks of bends	69	56
Through regular channels	1	10
Over the banks of points and reaches	30	34
Total	100	100

We may summarize as follows: A very small percentage of the water that leaves the river passess through regular water-courses; most of the water that, at any time, leaves the river and nearly all of the overflow water that traverses the Saint Francis Bottom, escapes from the river in bends; a major part of the return occurs over the banks in bends; the greater part of the escape over the banks of points, merely crosses these to return a short distance below.

There are three causes—two applying to velocity and one to depth—that would develop expectations of greater escape in the bends than in other portions of the river front: First, on account of the converging angle formed by the directions of the bank of the bend and the current in the river, and a consequent conservation of momentum. Second, on account of the general concavity of bends and the resulting proximity of the deep channel and swift velocity, which is conducive to a greater initial velocity of the escaping water. Third, on account of the relatively lower elevation of the bank in bends as compared with other divisions of the river front; for, as most of the bends have caving banks, the bank-destroying process of the river is operative thereat, and, as the slope of the land is generally from the river, the height of the banks is being constantly reduced. By antithesis, on points the bank-building process is generally active, and the river front is of normal or increasing elevation. We find as a consequence that the depth of overflow is greater in the bends than at other localities.

If the term "marked depressions in the bank" be confined to sloughs and bayous, then a very small percentage of the outflow or of the inflow occurs therein; but if the banks of bends are regarded as such, which they may very properly be considered in their relation to other portions of the river front, then they are the channels for the greater part of the outflow and a major part of the inflow along the Saint Francis Front.

MAXIMUM DISCHARGE.

In order to estimate the entire discharge at high water of the Mississippi River on different latitudes the following localities were selected: Columbus, Ky., Fulton, Tenn., and Hampton discharge section; and estimates made.

COLUMBUS, KENTUCKY.

The discharge at the highest stage, February 26, 1882, not having been measured, the following estimate has been made from the data obtained by Assistant J. H. Davis, 1881–'82.

Maximum gauge-reading, February 26	feet	102.801
Gauge-reading, February 22	do	101.301
Increment	do	1.5
Maximum width, February 28	do	2,694
Water area, February 22	square feet	196,020
Increment to water area (2,694 by 1.5)	do	4,041
Probable water area on February 26	do	200,061
Maximum mean velocity, March 1, per second	feet	8.246
Probable discharge on February 36 (200,061 by 8.3) per second	cubic feet	1,660,496

FULTON, TENNESSEE.

The discharge data obtained by Assistant W. H. Powless, 1879–'80, were used, as follows:

Maximum gauge-reading, March 1, 1882	feet	36.69
Low water of 1879, reads on gauge	do	2.14
High water 1882 above low water 1879	do	34.55
Stage March 14, 1880, above low water 1879	do	32.00
Stage March 1, 1882, above stage March 24, 1880	do	2.55
Maximum width of high water, 1880	do	2,615
Water area March 24, 1880	square feet	144,270
Increment (2,615 by 2.55)	do	7,668
Probable water area, March 1, 1882	do	151,938

$$V = 0.204\ (h - 21.8),\ \text{Powless.}$$

Where V = mean velocity, h = gauge-reading above low water of 1879 + 27.77 feet.
March 1, 1882, V = 0.204 (62.32—21.8) = 8.27 feet per second.
Probable discharge on March 1, 1882 (151,938 by 8.27), 1,261,527 cubic feet per second.

HAMPTON.

This discharge-section was located about 12 miles below Memphis, and just below the junction of the bend and chute of President's Island.

The data used are those obtained from the observations of Prof. H. B. Herr, 1879.

High water of 1882, Memphis gauge	feet	35.15
Increment for oscillation at Hampton	do	1.72
Probable reading on Hampton gauge of high water of 1882	do	36.87
Stage on Hampton gauge, February 12, 1879	do	27.00
Increment	do	9.87
Width of river	do	4,600
Water area, February 12, 1879	square feet	179,948
Increment (4,600 by 9.87)	do	45,402
Probable water area for maximum stage, 1882	do	225,350

Using the formula deduced from Professor Herr's observations, by Assistant R. E. McMath:

$$V = .0725\ \triangle.$$

Where V = mean velocity, and $\triangle$ = stage on Hampton gauge + 37.18, we have, for high water of 1882:

$$V = .0725\ (36.87 + 37.18) = 5.37 \text{ feet per second.}$$

The probable discharge for high water of 1882 is (225,350 by 5.37) 1,210,130 cubic feet per second; hence, we get for flood of 1882:

COLUMBUS, KENTUCKY.

	Cubic feet per second.
Probable maximum discharge	1,660,000
Escape above	86,000
Total	1,746,000

FULTON, TENNESSEE.

Probable maximum discharge	1,261,000
Escape above	494,000
Total	1,755,000

HAMPTON.

Probable maximum discharge	1,210,000
Escape above	599,000
Total	1,809,000

These estimates give an increase of discharge of 9,000 cubic feet per second between Columbus and Fulton, and 63,000 cubic feet per second between Columbus and Hampton, which, considering the character of the work done on the Saint Francis Front, the number of small tributaries on the left bank of the river between these points, and the probable error in estimating the discharge of the river proper, may be regarded as a very close agreement.

TOTAL ESCAPE.

In order to form a conception of the volume of water that traverses the Saint Francis Bottom during the time of flood, the subjoined estimate has been made.

The right bank from Commerce, Mo., to opposite Memphis has been regarded as the river front that is tributary to the supply of the Saint Francis Bottom, for although there is a point some distance below Memphis which shows a greater net escape, this is due to the fact that a large quantity of water leaves the river there to return in a short distance, and it cannot properly be regarded as supply.

The amount of escape at mean flood stage was taken as the mean escape for the continuous flood period, that is, the number of consecutive days when the stage was above the flood zero.

Although there was no escape above New Madrid at mean flood stage, which was due, in all probability, to the deflection, by the ridge, of all of the overflow water and its return to the river, still, at an increased stage, such as the one when the examination was made, we find a net escape of 20,000 cubic feet per second, which was probably caused by a portion of the ridge being submerged and a consequent escape into the country back of it; and, as there were thirty-seven days during which the river was near, at, or above this stage, a mean discharge of 30,000 cubic feet per second has been assumed at this period of time.

	Cubic feet.
Above New Madrid, Mo., thirty-seven days, at 30,000 cubic feet per second	95,904,000,000
Between New Madrid and Fulton, seventy-eight days, at 154,000 cubic feet per second	1,037,837,000,000
Between Fulton and Memphis, eighty-eight days, at 67,000 cubic feet per second	509,414,000,000
Total escape	1,643,155,000,000

This amount of water is equal to 15.7 days' discharge of the river at Hampton, estimating its capacity as 1,210,000 cubic feet per second; or 10.5 days at 1,800,000 cubic feet per second.

Table of water escape of the flood of 1882 over that portion of the right bank of the Mississippi River forming the front of the Saint Francis Bottom, Commerce, Mo., to Helena, Ark.

[ABBREVIATIONS: V, surface velocity in feet per second. W, width in feet of thecross-section to which V and D are applied. S, soundings in feet. H, computed difference in feet between the stage of water at the time of observation and the stage for which the computation is made. D, computed depth. C, coefficients used to reduce V to mean velocity and to correct cross-section area for obstructions. A, direction of current; *f*, from river; *t*, toward; *n*, normal or at right angles with current of river; *d* diagonally, or a divergence of less than 45° with current of river; bearings are magnetic. Q, escape in cubic feet per second; with minus sign it indicates return flow. Q″, net escape in cubic feet per second.]

Locality.	Number.	Observation stage, March 7–15.								Maximum stage.				Mean flood stage.			
		V	W	S	C	A	Date of observation.	Q	Q″	H	D	Q	Q″	H	D	Q	Q″
							1882.										
In apex of Lucas Bend	8*	0.875	9,050	5	.65	*f, n*	Mar. 10	25,736	.....	3.02	8.02	41,177	.....	1.20	3.80	19,559	.....
Opposite foot of Islands No. 3 and 4	9	1.250	11,900	2.5	.65	S. 70° W.	Mar. 10	24,172	.....	2.98	5.48	52,598	.....	1.18	1.32	12,763	.....
								49,908	49,908	.....	.....	93,775	93,775	.....	.....	32,322	32,322
Opposite Iron Bank	10	0.266	12,300	1.0	.65	S. 10° E.	Mar. 10	−2,127	47,781	2.70	3.7	−8,005	85,770	1.13	.....	.....	.....
Opposite Columbus, Ky	11	0.233	7,000	0.5	.65	*f*	Mar. 10	530	.....	2.55	3.05	3,230	.....	1.10	.....	.....	.....
Opposite head of Wolf Island No. 5	12	0.4	17,000	4.5	.65	S. 20° W.	Mar. 10	19,890	.....	2.6	7.1	31,382	.....	1.12	3.38	14,940	.....
Opposite foot of Wolf Island No. 5	13	Slack.	.....	0.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.15	.....	.....	.....
Head of Beckwith's Bend	14	1.920	5,300	2.5	.65	S. 50° W.	Mar. 10	16,536	.....	2.77	5.27	34,863	.....	1.18	1.32	8,731	.....
Center of Beckwith's Bend	15	1.466	9,300	7	.65	S. 60° W.	Mar. 10	62,034	.....	2.80	9.80	86,867	.....	1.19	5.81	51,487	.....
Foot of Beckwith's Bend	16	0.95	7,300	1	.65	*f, n*	Mar. 10	4,508	.....	2.83	3.83	17,272	.....	1.20	.....	.....	.....
								103,498	151,279	.....	.....	173,614	259,384	.....	.....	75,158	107,480
Foot of Island No. 6, below Hickman	17	Slack.	.....	2.5	.....	.....	Mar. 10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Forty miles below Cairo	18	Slack.	.....	3.5	.....	.....	Mar. 10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Opposite French's Point	19	0.866	8,500	3.0	.65	*t, n*	Mar. 10	−14,534	.....	3.08	6.08	−29,117	.....	1.28	1.72	−8,330	.....
Opposite French's Point	20	0.666	8,400	5	.65	*t, n*	Mar. 10	−18,182	.....	3.10	8.1	−29,418	.....	1.29	3.71	−13,541	.....
Near Saint James' Bayou	21	0.250	6,800	5	.65	*t, n*	Mar. 10	−5,525	.....	3,15	8.15	−9,017	.....	1.30	3.70	−4,089	.....
Saint James' Bayou	21a 21b 21c	0.383 0.416 0.333	110	15 20 6	.8	*t, n*	Mar. 10	−471	.....	3.15	.....	−575	.....	1.30	.....	−428	.....
								−38,522	112,747	.....	.....	−68,193	191,191	.....	.....	−26,388	81,092

*From Commerce, Mo., to observation No. 8 there was no appreciable escape.

Table of water escape of the flood of 1882 *over that portion of the right bank of the Mississippi River forming the front of the Saint Francis Bottom, Commerce, Mo., to Helena, Ark.*—Continued.

Locality.	Number.	Observation stage, March 7–15.								Maximum stage.				Mean flood stage.			
		V	W	S	C	A	Date of observation.	Q	Q″	H	D	Q	Q″	H	D	Q	Q″
							1882.										
Bend of Island No. 8	22	Slack.															
Center of Bend of Island No. 8	23	0.800	8,000	3	.65	S. 85 W.	Mar. 10	12,480		3.21	6.21	25,844		1.32	1.68	6,989	
Lower end bend of Island No. 8	24	0.733	8,000	4.5	.65	S. 85 W.	Mar. 10	17,152		3.25	7.75	29,536		1.33	3.17	12,583	
Just below, opposite foot of Island No. 8	25	0.500	7,700	0.5	.65	*f, n*	Mar. 10	1,251		3.28	3.78	9,459		1.35			
Upper side Donaldson's Point	26	0.733		2.5		*p, w*	Mar. 10							1.36			
Do	27	1.2		2.5		*p, w*	Mar. 10							1.37			
Do	28	1.2	7,000	2.0	.65	*n, f*	Mar. 10	10,920		3.41	5.41	30,030		1.38	0.62	3,320	
Do	29	0.9	3,700	3.	.65	*f, n*	Mar. 10	6,493		3.44	6.44	13,949		1.40			
Do	30	1.0	3,900	3.	.65	S. 85 W.	Mar. 10	7,605		3.48	6.48	16,427		1.40	1.60	4,056	
								55,901	168,648			125,245	316,436			26,448	107,540
On Donaldson's Point	31	0.45		3.5		*p, w*	Mar. 10										
Down-stream side Donaldson's Point	32	Slack.		12			Mar. 10							1.46			
Do	33	Slack.		6			Mar. 10							1.47			
Do	34	1.0	6,500	5	.65	*t, n*	Mar. 10	—21,125		3.70	8.7	—36,757		1.48	3.52	14,872	
Do	35	0.767	9,500	6	.65	*t, n*	Mar. 10	—28,417		3.74	9.74	—46,121		1.49	4.51	—21,360	
Upper end New Madrid Bend	36	0.833	8,000	9	.65	*t, n*	Mar. 10	—38,984		3.78	12.78	—55,380		1.50	7.50	—32,489	
Do	37	1.0	10,600	6	.65	*t, n*	Mar. 10	—41,340		3.80	9.8	—67,522		1.50	4.50	—31,005	
Saint John's Bayou	38 a 38 38 b	1.15 4.0 1.833	150	18 24 18	.80	*t, n*	Mar. 10	— 6,240		3.8		— 7,356		1.48		— 5,806	
Little or Dry Bayou	39	1.5	1,000	12	.65	*t, n*	Mar. 10	—11,700		3.8	15.8	—15,405		1.47	10.53	—10,267	
								147,806	20,842			—228,541	87,895			—105,797	—8,257
Net escape above New Madrid						*t, n*			20,842				87,895				4,000
Just above upper end old Island No. 11.	40 41 42	0.5 0.5 0.95	200	2 1 1.5	.80	S. 50° W.	Mar. 10	156		3.31		509		1.41			
On old Island No. 11	43	Slack.		6.5			Mar. 10							1.38	5.12		
Upper side of Ruddle's Point	44 45 46	1.133 2.333 1.133	400	1 5 1	.80	N. 85° W.	Mar. 11	1,507		3.18		3,158		1.28			
Lower side of Ruddle's Point	47 a 47 b	0.3 0.2		5 4	.65	*f, n*	Mar. 11										

Cushion Lake Bayou	47 c 47 47 d	1.2 1.33 1.2	50	9 13.5 9	.80	*f, n*	Mar. 11	527		2.82		663		1.18		462	
Do	47 e 47 f	0.8 0.267		4 5	.65	*f, n*	Mar. 11										
Do	47 a, b 47 e, f	0.4	10,800	4.5	.65		Mar. 11	12,636		2.82	7.32	19,852		1.18	3.32	9.323	
Little Cypress Bend	48	0.722		3	.65	*p, w*	Mar. 11			2.77	5.77			1.15	1.85		
Opposite lower end Island No. 13.	49	0.8	23,650	1	.65	*f, n*	Mar. 11	12,298		2.57	3.57	43,904		1.07			
1½ miles below No. 49	50	1.333	1,300	1	.65	*f, n*	Mar. 11	1,126		2.48	3.48	3.921		1.05			
								28,250	49,092			72,007	159,902			9,785	9,785
Foot of Island No. 14	51	1.333		2		*p, w*	Mar. 11			2.19				0.96			
Robinson Lake Bayou	52	0.667	120	5		*t, n*	Mar. 11	— 320		2.17	7.17	— 574		0.95	4.15	— 266	
Bank near Robinson Lake Bayou	52 a	0.500	2,400	3	.65	*t, n*	Mar. 11	— 2,340		2.17	5.17	— 4,033		0.95	2.15	— 1,677	
								— 2,660	46,432			— 4,607	159,295			— 1,943	7,842
One mile above Gayoso	53	0.467	12,300	3	.65	*f, n*	Mar. 11	11,200	57,632	2.10	5.1	19,042	174,337	0.93	2.17	8,300	16,142
Bayou at Gayoso	54	1.0	250	8	.8	*t, n*	Mar. 11	— 1,600	56,032	2.05	10.05	— 2,010	172,327	0.90	7.10	— 142	16,000
One mile below Gayoso	55	1.333	7,650	3	.65	*f, n*	Mar. 11	19,890		2.02	5.02	33,316		.89	2.11	13,973	
Two miles below Gayoso	56	1.2	5,850	4	.65	*f, n*	Mar. 11	18,252		1.98	5,98	27,288		.88	3.12	14,237	
1½ miles above Caruthville	57	1.467	8,200	1.5	.65	*f, n*	Mar. 11	11,729		1.94	3.44	26,916		.87	0.63	4,926	
Do	58	Slack.		0.5			Mar. 11							.83			
One mile below Caruthersville	58 a 58 b 58 58 c 58 d	0.850 1.0 0.8 0.850 Slack.	600	2 2 3 1.5 0.5	.72	*f, n*	Mar. 11	796		1.8		1,469		.83	1.3	491	
								50,667	106,699								
1¾ miles above foot Islands 16 and 17 in chute.	59 a	1.5	1,500	1.0	.72	*f, n*	Mar. 11	1,620		1.44	2.44	3,953		0.72	0.28	454	
One-fourth mile below foot Islands Nos. 16 and 17.	59	0.8		0.5		*f, d*	Mar. 11			1.4				0.70			
In chute of Island No. 18*	60																
Half Moon Bayou	60 a	0.5	150	2.0	.72	*f, n*	Mar. 11	108		1.26	3.26	176		0.68	1.32	71	
Break in levee	61	3.867	250	1.5	.72	*f, n*	Mar. 11	1,044		1.24	2.74	1,908		0.68	0.82	571	
1 mile below Cottonwood Point	62	1.150	9,700	1.5	.65	*f, n*	Mar. 11	10,876		1.19	2.69	19,545		0.66	0.84	6,091	
Pemiscot Bayou	63 63 a 63 b	2.85	40	8 12 6	.8	N. 80° W.	Mar. 11	790		1.18		578		0.67	8.00	730	
Midway Landing opposite Island No. 21	64	1.333	10,900	2	.65	*f, n*	Mar. 11	18,889		1.17	3.17	29,970		0.65	1.33	12,610	
State line, Missouri and Arkansas	65	1.5	8,350	0.5	.65	*f, n*	Mar. 11	4,070		1.13	1.63	13,270		0.65			
Holman's Landing, opposite Island No. 21	66	1.0	10,560	5	.65	*f, n*	Mar. 11	34,320		1.12	6.12	42,008		0.68	4.32	29,652	

* Land about even with surface of water.

Table of water escape of the flood of 1882 *over that portion of the right bank of the Mississippi River forming the front of the Saint Francis Bottom, Commerce, Mo., to Helena, Ark.*—Continued.

Locality.	Number.	Observation stage, March 7–15.								Maximum stage.				Mean flood stage.			
		V	W	S	C	A	Date of observation.	Q	Q″	H	D	Q	Q″	H	D	Q	Q″
							1882.										
Hickman's Landing, opposite foot Island 21	67	0.675	11,700	1	.65	*f, n*	Mar. 11	5,133	.....	1.10	2.1	10,599	.....	0.68	0.32	1,708	.....
Upper side of Wright's Point	68	1.0	6,950	1.5	.65	*f, n*	Mar. 11	6,777	.....	1.09	2.59	11,701	.....	0.70	0.80	3,614	.....
Lower side of Wright's Point	69	0.667	4,000	0.7	.65	*f, n*	Mar. 11	1,214	.....	1.07	1.14	1,976	.....	0.70	.....	.....	.....
Buckner's Landing, opposite Rucker's Point	70	Slack.	.....	2	.....	.....	.....	.....	.....	1.02	.....	.....	.....	0.72	.....	.....	.....
Barfield Landing	71	Slack.	.....	4	.....	.....	.....	.....	.....	1.01	.....	.....	.....	0.73	.....	.....	.....
¼ mile below Barfield Landing	72	.1 167	5,750	3	.65	*f, n*	Mar. 11	13,085	.....	1.00	4.0	17,566	.....	0.74	2.26	9,814	.....
Foot of Tow-head of Island No. 25	73	Slack.	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.76	.....	.....	.....
Canadian Reach, opposite Forked Deer Island	74	1.250	9,400	5	.65	*f, n*	Mar. 11	38,187	.....	0.92	5.92	45,214	.....	0.77	4 23	32,242	
								136,113	242,812	.....	.....	287,453	459,780	.....	.....	131,184	147,184
Canadian Reach, opposite foot Forked Deer Island	75	0.733	8,500	1.5	.65	*t, n*	Mar. 11	— 6,075	.....	0.91	2.41	— 9,770	.....	0.78	0.72	—2.916	.....
Island No. 28, back Ashport bar	76	Slack.	.....	2	.....	.....	Mar. 12	.....	.....	.....	.....	.....	.....	0.79	.....	.....	.....
Island No. 28, back Ashport bar	77	0.5	8,000	3	.65	*t, n*	Mar. 12	— 7,800	.....	0.87	3.87	—10,088	.....	0.80	2.20	—5,720	.....
Mill Bayou	78	0.467	150	15.5	.8	*t, n*	Mar. 12	— 869	.....	0.84	16.34	— 916	.....	0.80	14.70	— 824	.....
								—14,744	228,068	.....	.....	—20,783	438,997	.....	.....	—9,460	137,724
Fletcher's Landing, above Osceola	79	1.133	6,920	3.5	.65	*f, n*	Mar. 12	17,837	.....	0.83	4.33	22,170	.....	0.80	2.70	13,760	.....
Powless' (n. p.)	79 a	1.5	9,500	1.9	.65	*f, n*	Mar. 12	17,599	.....	0.81	2.71	25,132	.....	0.81	1.09	10,096	.....
								35,436	263,504	.....	.....	.....	.....	.....	.....	.....	.....
Elmot Landing	80	Slack.	.....	1.5	.....	.....	.....	.....	.....	0.8	.....	.....	.....	0.82	.....	.....	.....
Net-scape above Osceola, Ark		.....	.....	.....	.....	.....	.....	.....	263,504	.....	.....	47,302	486,299	.....	.....	23,856	161,580
Opposite angle of Bullerton Tow-head	81	3.0	600	4.5	.65	*f, n*	Mar. 12	5,265	.....	0.77	5.27	6,166	.....	0.84	3.66	4,282	.....
Tanza Landing	82	2.667	250	2	.65	*f, n*	Mar. 12	867	.....	0.75	2.75	1,191	.....	0.85	1.15	498	.....

Craighead Point, upper side	83	1.533	9,300	2.5	.65	f, n	Mar. 12	23,167		0.72	3.22	35,605		0.86 1.64	15,198	
								29,299	292,803			42,962	529,261		19,978	181,558
Craighead Point, lower side	84	1.133	6,700	6.5	.65	t, n	Mar. 12	—32,072	260,731	0.70	7.20	—35,537	493,724	0.89 5.61	—27,681	153,877
Net escape above Old Fulton discharge section									260,731				493,724			153.877
In Chute Island 34, opposite upper end of island.	85	1.0	130	1.5	.65	f, n	Mar. 12	920		0.64	2.14	741		0.910.59	622	
	86	1.867	60	2.0	.65	f, n				0.64	2.64			0.911.09		
	87	2.15	85	2.5	.65	f, n				0.64	3.14			0.911.59		
In chute opposite middle Island 34.	88	2.0	90	3.0	.65	f, n	Mar. 12			0.64	3.64	426		0.922.08		
Nodena or Fletcher's Landing, in chute of Island No. 34.	89	3.133	1,200	0.7	.65	f, n	Mar. 12	1,710		0.63	1.33	3,253		0.93		
Upper side Morgan's Point	90	2.0		5.0		p, w	Mar. 12			0.62				0.944.09		
Lower side of Morgan's Point, opposite head Island 35.	91	Slack.		0.8			Mar. 13							0.98		
Lanier's, bend of Island 35	92	2.15	500	3.0	.72	f, n	Mar. 13	2,096		0.60	3.6	2,515		1.011.99	1,540	
One-half mile below Lanier's	93	0.8	1,800	1.0	.65	f, n	Mar. 13	936		0.60	1.6	2,148		1.01		
One and three-quarter miles below Lanier's.	94	1.467	150	2.5	.72	f, n	Mar. 13	396		0.60	3.1	491		1.021.48	234	
Bend of 35, 1 mile above Pecan Point.	95	Slack.		0.3			Mar. 13							1.04		
Bayou at Pecan Point	96	0.5	40	2.5	.8	f, n	Mar. 13	40		0.58	3.08	50		1.041.46	23	
								6,098	266,829			9,624	503,348		2,419	156,296
Shawnee Landing, bend of Island 37.	97	0.750	750	2.5	.8	t, n	Mar. 13	—1,125	265,704	0.55	3.05	— 1,380	501,968	1.101.40	— 630	155,666
One-half mile above Viola Landing, in Devil's Elbow Bend.	98	1.8	90	1.5	.72	t, n	Mar. 13	175		0.54	2.04	246		1.121.38	161	
Old chute, Island 38, in Devil's Elbow Bend.	99	0.867	150	2.5	.8	f, n	Mar. 13	260		0.54	3.04	317		1.131.37	143	
Lower chute, Island 38, Devil's Elbow Bend.	100	1.133	275	3.0	.8	f, n	Mar. 13	748		0.53	3.53	880		1.131.87	466	
Fogelman's Chute	101	0.933	10,000	1.0	.65	S. 30 W.	Mar. 13	6,065		0.53	1.53	9,295		1.14		
								7,248	272,952			10,738	512,706		7701	56,436
Poker Point	102	Slack.		4.5			Mar. 13							1.16		
Opposite Beef Island Chute, upper end.	103	0.5		2.5		p, w	Mar. 13							1.17		
Upper end of Beef Island Bend	104	0.4	10,400	5.0	.65	t, n	Mar. 13	—13,520	259,432	0.51	5.51	—13,572		1.173.83	—10,356	
Bayou Bradley's	105	1.0	50	1.5	.8	t, n	Mar. 13	— 60		0.51	1.5	— 610		1.180.32	— 13	
Landing break in levee	105 a	0.75	150	2.5	.72	t, n	Mar. 13	— 202		0.50	3.0	— 243		1.181.32	— 107	
								— 262	259,170			—14,425	498,281		—10,476	145,960
Beef Island Bend, opposite Island No. 40.	106	0.533	7,000	4.0	.65	f, n	Mar. 13	9,700		0.50	4.5	10,920		1.192.81	6,815	
Do	107	1.4	7,800	6.0	.65	S. 70 W.	Mar. 13	4,259		0.50	6.5	46,137		1.204.80	34,070	
Do	108	0.2	7,200	3.0	.65	f, n	Mar. 13	2,808		0.50	3.5	3,276		1.211.79	1,675	

le of water escape of the flood of 1882 *over that portion of the right bank of the Mississippi River forming the front of the Saint Francis Bottom, Commerce, Mo., to Helena, Ark.*—Continued.

Locality.	Number.	Observation stage, March 7–15.								Maximum stage.				Mean flood stage.			
		V	W	S	C	A	Date of observation.	Q	Q″	H	D	Q	Q″	H	D	Q	Q″
							1882.										
Beef Island Bend, opposite Island No. 40	109	1.333	4,400	3.5	.65	*f, n*	Mar. 13	13,347	.....	0.49	3.49	15,168	.....	1.22	2.28	8,694	.....
Beef Island Bend, opposite Island No. 41.	110	1.6	4,200	5.0	.65	*f, n*	Mar. 13	21,840	.....	0.49	5.49	24,024	.....	1.22	3.78	16,511	.....
Redman's Point, upper side	111	1.133	5,800	1.0	.65	*f, n*	Mar. 13	4,271	.....	0.48	1.48	6,499	.....	1.23	.....	.....	.....
								56,225	315,395			106,024	604,305			67,765	213,725
Redman's Point, lower side	112	0.6	.....	3.0	.....	*p, w*	Mar. 13	.....	.....	.....	.....	.....	.....	1.24	1.76	.....	.....
Two bayous behind Chicken Island.	113	4.0	250	7.0	.8	*t, n*	Mar. 13	— 5,600	.....	0.47	7.47	— 5,980	598,325	1.27	5.73	— 4,584	.....
Right bend of chute of Chicken Island.	113 a	0.267	14,000	2.5	.65	*t, n*	Mar. 13	— 6,074	.....	0.47	2.97	— 7,280	591,045	1.27	2.23	— 2,999	.....
								—11,674	303,721							— 7,583	206,142
Chute of Chicken Island	114	1.333	.....	32.0	.....	.....	Mar. 13	.....	.....	.....	.....	.....	...	1.27	.....	.....	.....
Below mouth of chute	115	1.6	3,000	6.0	.65	*f, d*	Mar. 13	18,720	.....	0.46	6.46	20,280	611,325	1.28	4.72	14,726	220,868
Hopefield Point	116	0.7	.....	1.5	.....	*p, w*	Mar. 14	.....	.....	.....	.....	.....	.....	1.30	0.20	.....	.....
Net escape above Hopefield*	.....	.....	.....	.....	.....	.....	.....	.....	322,441	.....	.....	.....	611,325	.....	.....	.....	220,868
Lower side of Hopefield Point	117	2.4	4,000	1.0	.65	*t, n*	Mar. 14	— 6,240	.....	0.61	1.61	—10,040	.....	.....	.....	.....	.....
Do	118	3.2	300	1.0	.65	*t, n*	Mar. 14	— 624	.....	0.62	1.62	— 1,010	.....	.....	.....	.....	.....
Falls—Difference in height, 1½ feet	119	2.4	50	1.5	fr.for	*t, n*	Mar. 14	— 1,000	.....	0.62	.....	— 270	.....	.....	.....	.....	.....
Falls—Difference in height, 2 feet	120	5.5	250	1.0	fr.for	*t, n*	Mar. 14	— 1,400	.....	0.63	1.63	— 2,100	.....	.....	.....	.....	.....
Do	120 a	1.5	6,000	1.0	.65	*t, n*	Mar. 14	— 5,850	.....	0.63	1.63	— 9,516	.....	.....	.....	.....	.....
								—15,114	307,327			—22,936	588,389				
President's Island bend	121	1.7	2,500	2.0	.65	*f, n*	Mar. 14	5,525	.....	0.64	2.64	7,292	.....	.....	.....	.....	.....
Do	122	1.533	400	2.5	.65	*f, n*	Mar. 14	996	.....	0.65	3.15	1,256	.....	.....	.....	.....	.....
Do	123	1.533	1,000	1.5	.65	*f, n*	Mar. 14	1,495	.....	0.66	2.16	2,151	.....	.....	.....	.....	.....
								8,016				10,699	599,088				
Net escape above Hampton cross-section	.....	.....	.....	.....	.....	.....	.....	.....	315,343	.....	.....	.....	592,088	.....	.....	.....	.....
Horn Lake bend	124	0.667	3,000	3.0	.66	*f, n*	Mar. 14	3,902	319,245	0.67	3.67	4,797	603,885	.....	.....	.....	.....

Cow Island bend	125	1.8	300	3.0	.72	f, n	Mar. 14	— 1,166	318,079	0.69	3.69	— 1,434	602,451				
Do	126	1.333	5,000	2.0	.65	f, n	Mar. 14	8,667		0.70	2.70	11,700					
Graves' Bayou	127	0.20	50	6.0	.80	f, n	Mar. 14	48		0.71	6.71	54					
								8,715	326,794								
Do	128	0.40	2,600	1.0	.65	f, n	Mar. 14	—676		0.72	1.72	1,166					
												12,920	615,371				
Break in levee	129	1.75	320	5.5	.65	t, n	Mar. 14	— 2,002		0.75	6.25	— 2,275					
Break in levee	130	0.45	300	1.8	.8	t, n	Mar. 14	— 194		0.76	2.56	— 278					
Vicinity of Porter Bayou	131	1.533	3,000	9.0	.65	t, n	Mar. 14	—26,904		0.77	9.77	—29,211					
Porter or Lost Bayou	132 a	0.4	250	3.0	.8	t, n	Mar. 14	—2,397		0.78		— 2,049					
	132 c	1.5		22.5		t, n	Mar. 14										
	132 b	0.5		2.0		t, n	Mar. 14										
								—32,173	294,621			—33,813	581,558				
Upper portion Buck Island bend 2½ miles below Bennet's Landing	133	0.567	4,000	1.0	.65	f, n	Mar. 14	1,474		0.78	1.77	2,314	588,872				
Do	134	0.533	3,000	1.5	.65	f, n	Mar. 14	1,559		0.79	2.29	2,379					
Do	135	1.067	3,000	3.0	.65	f, n	Mar. 14	6,245		0.80	3.80	7,897					
								9,275	303,896			10,276	594,148				
Do	136	1.700	11,000	6.0	.65	f, n	Mar. 14	—72,930		0.80	6.80	—82,654					
Holtbee Bayou	137	1.600	100	10.5	.8	t, n	Mar. 14	— 1,344		0.81	11.31	— 2,317					
Council Bend	137 a	1.600	7,000	3.0	.65	t, n	Mar. 14	—21,840		0.81	3.81	—27,755					
Frenchman's Bayou	138	0.200	200	18.0	.8	t, n	Mar. 14	—576		0.81	18.81	—602					
								—96,690	207,206			—113,328	480,820				
Council Bend	139	1.333	4,000	6.5	.65	n, f	Mar. 14	22,530		0.81	7.31	25,350					
Do	140	0.533		5.0		p, w	Mar. 14										
Council Bend	141	2.6	3,000	6.0	.65	f, n	Mar. 14	30,420		0.82	6.82	34,554					
Mouth of Council Bend	142	0.767		3.0		p, w	Mar. 15										
Upper portions of Ashley Point	143	1.150	5,000	7.0	.65	f, n	Mar. 15	26,162		0.82	7.82	29,250					
Do	144	Slack		6.5			Mar. 15										
Do	145	0.700	3,000	6.0	.65	f, n	Mar. 15	8,190		0.83	6.83	9,321					
								87,302	294,508			98,475	579,295				
Lower portions of Ashley Point	146	1.133	3,000	6.0	.65	f, n	Mar. 15	—26,512		0.86	6.86	—30,303					
Walnut Bend	147	1.333	6,000	3.0	.65	t, n	Mar. 15	—15,600		0.86	3.86	—20,085					
Do	148	1.333	8,000	7.0	.65	t, n	Mar. 15	—48,553		0.86	7.86	—54,496					
Do	149	1.267	100	8.0	.8	t, n	Mar. 15	— 811		0.86	8.86	— 898					
Do	150	0.533	6,000	6.0	.65	t, d	Mar. 15	—12,472		0.86	6.86	—14,274					
Do	151	1.133	6,000	2.5	.65	t, n	Mar. 15	—11,047		0.86	3.36	—14,820					

*Hopefield, Arkansas, being considered as the limit of supply to the Saint Francis Bottom, the computation for mean flood stage was made to that point only.

Table of water escape of the flood of 1882 *over that portion of the right bank of the Mississippi River forming the front of the Saint Francis Bottom, Commerce, Mo., to Helena, Ark.*—Continued.

Locality.	Number.	Observation stage, March 7–15.								Maximum stage.				Mean flood stage.			
		V	W	S	C	A	Date of observation.	Q	Q″	H	D	Q	Q″	H	D	Q	Q″
							1882.										
Walnut Bend	152	1.150	5,000	3.0	.65	*t, d*	Mar. 15	— 11,212		0.87	3.87	— 14,462					
								—126,207	168,301			—149,338	429,957				
Upper side Hardin's Point	153	0.325	14,000	6.0	.65	*f, n*	Mar. 15	17,745		0.87	6.87	20,584					
Do	154	1.733	10,000	6.5	.65	*f, n*	Mar. 15	73,219		0.87	7.37	83,005					
								90,964	259,265			103,589	533,546				
Lower side Hardin's Point	155	1.000	24,000	7.0	.65	*t, n*	Mar. 15	—109,200		0.88	7.88	—122,928					
Do	167a	1.867	100	10.0	.8	*t, n*	Mar. 15	— 1,494		0.88	10.88	— 1,625					
Upper chute of Saint Francis Island	167	1.533	50	10.5	.8	*t, n*	Mar. 15	— 644		0.88	11.38	— 698					
Lower chute of Saint Francis Island	166	2.000	100	24.0	.8	*t, n*	Mar. 15	— 3,840		0.89	24.89	— 3,982					
Between lower end of Saint Francis Island and mouth of Saint Francis	165a	1.067	24,000	7.0	.65	*t, n*	Mar. 15	—116,516		0.89	7.89	—131,502					
1¾ miles above mouth of Saint Francis River	165	1.133	50	10.5	.8	*t, n*	Mar. 15	— 476		0.89	11.39	— 516					
Left bank mouth of Saint Francis	164	1.430	2,000	6.0	.65	*t, d*	Mar. 15	— 11,154		0.89	6.89	— 12,675					
The whole distance from mouth of Saint Francis River to Helena was multiplied into the arithmetical mean of V, multiplied by S or mean velocity (in square feet) per linear foot of river front.	163	1.000	36,000	4.0	.65	*t*	Mar. 15	—169,884		0.89	4.89	—196,934					
	163 b	1.200		5.0						0.89	5.89						
	163 c	1.333		4.5						0.89	5.39						
	162	1.500		6.0						0.89	6.89						
	161	1.600		6.5						0.89	7.39						
	160	2.000		6.0						0.89	6.89						
	159	1.900		5.0						0.89	5.89						
	158	0.200		4.5						0.89	5.39						
	157	1.100		7.5						0.90	8.40						
	156	0.900		8.0						0.90	8.90						
								—413,208	—153,943			—470,860	62,686				
Excess of outflow over inflow along the Saint Francis front									153,943								

3.—WHITE RIVER AND TENSAS FRONTS, AND ARIZONA AND LANDRY CREVASSES, FLOOD OF 1882.

(Observations by J. B. Johnson and Hunter Stewart, United States Assistant Engineers.)

(Report by Hunter Stewart, United States Assistant Engineer.)

OFFICE OF MISSISSIPPI RIVER COMMISSION,
Saint Louis, Mo., April 17, 1883.

SIR: I have the honor to submit, herewith inclosed, a report upon the reconnaissance, during the flood of 1882, of that portion of the right bank of the Mississippi River situated between Helena, Ark., and the mouth of Cypress Creek: upon the high water examination of the Tensas Front, for the flood of 1882, and upon the examination of the right bank from Red River to Donaldsonville during the same flood.

Very respectfully, your obedient servant,

HUNTER STEWART,
United States Assistant Engineer.

First Lieut. SMITH S. LEACH,
Secretary Mississippi River Commission.

REPORT.

WHITE RIVER BOTTOM.

The steam-tug Frolic was detailed for this service.

The engineer force consisted of J. B. Johnson and Hunter Stewart, United States assistant engineers.

The methods of making observations and of estimating the discharge were similar to those used by Messrs. Johnson and Stewart in their examinations of the Yazoo and Saint Lawrence fronts, respectively, for the flood of 1882, and are described in their reports respecting the same.

The bottoms situated back, or west, of the section of the Mississippi River under consideration may be divided into three sections or basins:

(1.) The White River bottoms, or that portion of the overflowed lands situated between Helena and the mouth of the White River.

(2.) The islands surrounded by the White, the Arkansas, and the Mississippi rivers.

(3.) The Arkansas River and Cypress Creek bottoms, which extend from the mouth of the Arkansas River to Cypress Creek.

The three basins, taken either separately or conjointly, have comparatively but small capacity to deplete the Mississippi River of its flood waters, or to perform the function of reservoirs to the same.

In view of the above fact in connection with the subsidence of the flood and the more important work which had to be done below, the examinations of these fronts were made in a cursory manner, and only the more important features were noticed.

Such observations as were made are given below. On March 25, 1882, the crevasse just below Helena was examined:

Width (estimated), 2,500 feet.
Surface velocity, 3.4 feet per second.
Depth (mean of soundings), 9 feet.
Coefficient to reduce surface velocity to mean velocity, .7.
Discharge, 54,000 cubic feet per second.

For maximum stage:	Feet.
Helena gauge, March 8, 1882, maximum	47.2
Helena gauge, March 25	45.2
Increment	2.0

Discharge, 63,000 cubic feet per second.

This result may be regarded as approximately correct, as the increase in the cross-section area, due to the probable widening of the crevasse, may be conssidered to be compensated in the discharge computation by the reduction in surface velocity due to the filling up of the swamps and the reduction of head by the fall of the river itself.

March 27, at Westover, opposite Friar's Point, there were three breaks:

Width (aggregate), 1,200 feet.
Surface velocity (mean), two-third foot per second.

Depth (mean of soundings), 4½ feet.
Discharge, 2,500 cubic feet per second.
On Kangaroo Point the water was flowing back into the river for a distance of 2,600 feet and at the rate of 1 cubic foot per second per linear foot. Return flow, 2,600 cubic feet per second.
From Kangaroo Point to Old Town Landing there were two breaks in the levee, 300 and 110 feet wide, respectively, at the date of observation. When examined the currents in these were from the river at the rate of one-third of a foot per second on the surface. From information received, it was learned that at the highest stage of the river these were discharging into the river with considerable velocity. This feature was probably due to the influence of the Old Town Ridge. From Old Town Landing to Cockleburr Bayou six breaks in the levee were reported.

LACONIA CIRCLE.

This tract of land, situated just above the mouth of White River, is subject to submergence from three sources, *i. e.*, the Mississippi River on its own front, the overflow water from the Mississippi River that escapes above, and the White River in the rear; it is completely surrounded with levees, which are intended to protect it from these. During the flood of 1882 but little damage was done previous to the rise in the White River, which backed up the overflow water that escaped from the Mississippi River above until it was higher than the back levees and, breaking these, inundated the circle. When the circle was filled, the overflow above continuing and being deprived of its usual outlet through the White River, the water rose above the front, or Mississippi River levees, and running over, broke them.
The water on the inside of the circle was from 1 to 1½ feet higher than the Mississippi River in the vicinity of Graddy's Landing, Desha County, Arkansas.

DISCHARGE OF THE WHITE RIVER.

On March 27 Montgomery Pass or Cut-off was examined. No perceptible current was found. The mean depth was 29 feet.
On March 28 the White River proper was gauged. The discharge section was located one-half mile below the head of Montgomery Pass, the base line and the width of the river were measured by means of the stadia, the ranges and base were located with a prismatic compass, seven soundings were taken approximately equidistant, and four rod floats were run, also approximately equidistant.
The base was 121 feet long, and the floats consisted of a 2-inch rod weighted to an immersion of 16 feet. The coefficient of nine-tenths is used to reduce the measured velocity to mean velocity, as the floats were run at an immersion a little less than one-third of the mean depth.
Width of the river, 750 feet.
Mean depth, 42.5 feet.
Mean of measured velocities, 4 feet per second.
Discharge, 115,000 cubic feet per second.
There was no apperent movement in the overflow on the right bank of the White River from the locality of the discharge section to the mouth, while there was an inflow into the White River over the left bank of about 1 cubic foot per second per linear foot. This would give the discharge of the White River into the Mississippi at the date of observing, 117,500 cubic feet per second.

Discharge of the White River at the maximum stage.

Water gauge at the mouth of White River:

	Feet.
Maximum stage, February 28, 1882	48.4
Observation stage, March 28, 1882	46.2
Increment	2.2

Mean depth for maximum stage, 42.5 + 2.2 = 44.7 feet.
Discharge, 121,000 cubic feet per second.
Supposing that at the maximum stage the discharge over the bank into the White River was double what it was at the observed stage, we would get 126,000 cubic feet per second as the total discharge of the White into the Mississippi at maximum stage.

Between the mouths of the White and Arkansas rivers.

From the mouth of the White River down the Middle Ground to the mouth of the Arkansas River, there was no apparent current, the land varying from 1 foot submergence to 1 foot exposure.

DISCHARGE OF THE ARKANSAS RIVER AT ITS MOUTH.

The observations were made on March 28, 1882. The discharge section was located 300 yards above the mouth of the Arkansas, and the methods used were the same as those employed in determining the discharge of the White River.

Width of Arkansas River, 750 feet.
Depth (mean of 8 soundings), 40.7 feet.
Mean of observed velocities, 2.17 feet per second.
Coefficient of reduction, .9.
Approximate discharge for observed stage, 62,000 cubic feet per second.

For maximum stage.

	Feet.
Maximum stage, Arkansas City gauge	47.1
Stage on March 28, Arkansas City gauge	44.1
Difference of stage	3.0
Mouth of White River, difference of stage	2.2
Increment for Arkansas River	2.7

Assuming that the other conditions are equal, we have for maximum stage:
Mean depth 40.7+2.7=43.4 feet, and discharge 64,000 cubic feet per second.

BAYOU ONE MILE ABOVE CYPRESS CREEK.

Width (effective), 130 feet.
Velocity, surface, 3.5 feet per second.
Mean depth, 33.4 feet.
Coefficient of reduction, .8.
Discharge, 12,000 cubic feet per second.

For maximum stage.

Mean depth, 33.4+2.6=36 feet.
Discharge, 13,000 cubic feet per second.
From the above bayou to Cypress Creek there was a flow into the Mississippi River of 9,000 cubic feet per second.

CYPRESS CREEK.

Cypress Creek was discharging into the Mississippi River, and the following estimate of the amount is made from the observations:

The total distance sounded was 1,000 feet, which is divided into two sections, *i. e.*, the main channel, Cypress Creek proper, and the auxiliary channel, or the sum of the distances on each side for which the velocity of the current was greater than that usual in the overflow.

For the main channel.

Width (estimated), 170 feet.
Mean depth, 30⅓ feet.
Surface velocity, 2.1 feet per second.
Coefficient of reduction, .8.
Discharge, 8,700 cubic feet per second.

For the auxiliary channel.

Width, 830 feet.
Mean depth, 10 feet.
Surface velocity, 1¼ feet per second.
Coefficient of reduction, .65.
Discharge, 6,800 cubic feet per second.

Total discharge of Cypress Creek at the date of observing, 15,500 cubic feet per second.

There is given below a tabulation of the discharge of such outlets as were gauged; also an estimate of their discharge at the maximum stage of the river.

These observations were scattering, and can give no conception of the total amount of water-escape from, or of the action of the overflow upon, that portion of the river bank which is comprised between their limits; nor is this report made with any such view, as there was no attempt at either a thorough examination or even a rough estimate of the movement of the overflow, for reasons hereinbefore mentioned.

The principal tributaries of the Mississippi River were, however, roughly gauged, as it was thought that such data would be of interest and, perhaps, of service in other relations, as well as that of high-water escape.

Table of measured discharges between Helena and the mouth of Cypress Creek:

Locality.	Stage at the time of observation.		Estimate for maximum stage.	
	Escape from river per second.	Flow into river per second.	Escape from river per second,	Flow into river per second.
	Cubic feet.	*Cubic feet.*	*Cubic feet.*	*Cubic feet.*
Helena	54,000	.....	63,000	.....
Westover	2,000	.....	10,000	.....
Kangaroo Point	.....	2,600	.....	12,000
Old Town Landing	600	.....	.....	18,000
White River	.....	117,500	.....	126,000
Arkansas River	.....	62,000	.....	64,000
Bayou, 1 mile above Cypress Creek	.....	12,000	.....	13,000
Between above bayou and Cypress Creek	.....	9,000	.....	9,000
Cypress Creek	.....	15,500	.....	18,300
Totals	56,600	218,600	73,000	260,300

TENSAS FRONT.

This section of the front of the Mississippi River extends along the right bank of the same, from Cypress Creek to the mouth of Red River.

The examination was made as follows:

March 29, 1882, a set of observations was made between Arkansas City and the west bank of Bayou Maçon, along the line of the Little Rock, Mississippi River and Texas Railroad, in order to determine the amount of water flowing through the bottoms.

This was done to obviate the necessity of measuring the inflow and outflow along the banks of the streams contiguous to this section, viz, the west bank of the Cypress Creek, from where it leaves the high land, to its mouth, and the west bank of the Mississippi River, from the mouth of Cypress Creek, to Arkansas City.

After the completion of the above, the right bank of the Mississippi River was examined from Arkansas City to Point Chicot.

March 30, 1882, the right bank was followed from Leland's to Ashton, after which the Frolic proceeded to Vicksburg to await orders. On the way down, Mr. J. B. Johnson, United States assistant engineer, made a second estimate of the breaks between Alsatia and Delta, La.; the first one having been made by him on March 21, 1882, after his reconnaissance of the Yazoo Front. Both estimates are given in the tabulated results.

March 30, 1882, orders were telegraphed for and their arrival awaited.

March 31, 1882, that portion of the Tensas Front comprised between Delta, La., and Shipp's Bayou, was examined.

April 2, 1882, the examination was continued from Shipp's Bayou to Waterproof.

April 3, 1882, the right bank was followed from Waterproof to the mouth of Red River, and the examination of the Tensas completed.

MODE OF OBSERVING.

As there was considerable escape into the swamps over the right bank of Cypress Creek, from where it leaves the high land to its mouth, and as there were frequent variations in the direction of the movement of the overflow water on that portion of the right bank of the Mississippi River extending from the mouth of Cypress Creek to Arkansas City, it was deemed more expedient to estimate the net escape above this latter point, by measuring the amount of water flowing through the bottoms on this latitude and making due allowance for the contribution of local watersheds, than to follow the entire tributary front; especially as the observations made under the latter method would have been more imperfect in their character.

Discharge observations over the line of the railroad from Arkansas City to Bayou Maçon were made as follows:

The widths of the sections were measured with a tape line along the bridges, trestles, and culverts, soundings were taken every 50 feet, and the surface velocity was measured with a log and line at intervals of 100 feet or less, as the variation in velocity demanded.

In computing the results, a coefficient of .8 is used to reduce the velocity at the surface to a mean.

From Arkansas City to Ashton and from Delta to the mouth of Red River the following methods were used:

Where there were breaks in the levee of requisite importance the width was measured with the stadia, the section in the line of the levee was sounded, and the surface velocity was measured with the log and line. If the section comprised between the ends of the levee showed a large amount of scour, attributable to the vertical movement of the water flowing through it, an auxiliary section was sounded, either in front, if the batture was extensive, or in the rear of the levee, where the vertical equilibrium of the water was somewhat restored; a velocity was measured for this auxiliary section and the width of the same estimated. Where the water was flowing over the top of the levee for a long stretch, the amount of discharge per linear foot was estimated and afterwards multiplied by the total distance found subject to such submergence. For small breaks the output was either disregarded or the discharge estimated in its entirety.

REDUCTION.

The following formula is used for computing the discharge:

$$Q = V \times W \times D \times C,$$

wherein:

Q = discharge.
V = surface velocity.
D = depth or mean of sounding.
W = width of cross-section.
C = coefficient of reduction.

COEFFICIENT.

The only velocity measured being that of the surface, a reduction to mean velocity is necessary in order to obtain the true discharge. The following have been adopted:

For open streams, mean velocity = surface velocity × .8.
Eor crevasses, mean velocity = surface velocity × .7.
For discharge over the banks, mean velocity = surface velocity × .65.

STAGE.

At Arkansas City the maximum gauge height occurred on February 28, nine days before the main flood-wave had reached Helena, while at Greenville it occurred on February 27, ten days previous.

At Lake Providence and Vicksburg the highest stage was reached on March 20, eleven days after the crest of the flood-wave reached Helena.

GAUGE-READINGS AND DIFFERENCES OF STAGE AT THE GAUGE STATIONS.

	Feet.
Arkansas City:	
Highest stage, February 28, 1882	47.10
Observed stage, March 29, 1882	44.05
Difference	3.05
Greenville:	
Highest stage, February 27, 1882	41.70
Observed stage, March 30, 1882	40.65
Difference	1.05
Lake Providence:	
Highest stage, March 20, 1882	38.32
Stage of first observation, March 20, 1882	38.32
Stage of second observation, March 30, 1882	36.35
Difference	1.97
Vicksburg:	
Highest stage, March 20 and 21, 1882	48.75
Observed stage, April 1, 1882	47.00
Difference	1.75

	Feet.
Saint Joseph, La.:	
Highest stage, March 20, 1882	44.90
Observed stage, April 2, 1882	43.85
Difference	1.05
Natchez:	
Highest stage, March 28 and 29, 1882	47.75
Observed stage, April 3, 1882	47.20
Difference	0.55
Red River Landing:	
Highest stage, March 27, 1882	48.50
Observed stage, April 3, 1882	48.10
Difference	0.40

Estimate of the amount of water flowing through the bottoms between Arkansas City and the west bank af Bayou Maçon, from measurements made along the line of the Little Rock, Mississippi River and Texas Railroad, on March 29, 1882.

Locality.	Cross-section area.	Mean velocity per second.	Discharge per second.
	Sq. ft.	*Feet.*	*Cu. ft.*
Chicot Bayou	16,748	1.35	22,600
Boggy Bayou	19,475	1.32	25,700
Culverts	375	2.16	800
Fulton Bayou	10,520	1.60	16,900
Dead Man's Bayou	13,375	1.28	17,200
Maçon Bayou	6,061	1.76	10,700
Total	66,554	1.41	93,900
Less, for local water-sheds	.....	.....	30,000
Amount of escape on this line	.....	.....	63,900

The maximum stage in the overflow was 32 inches above the observed stage.

For maximum stage:

	Cubic feet per second.
Escape at observed stage	63,900
Increment, 5,840 × 2.7 × 1.4	22,100
Escape at maximum stage	86,000

These figures give the probable net escape from Cypress Creek and the Mississippi River into the Tensas Bottoms above Arkansas City, for the maximum stage and a stage 3 feet below the maximum.

WATER ESCAPE INTO THE TENSAS BOTTOMS AT THE TIME OF OBSERVING.

	Cubic feet per second.
Net escape above Ashton	118,000
Net escape from Ashton to Delta	219,000
Net escape from Ashton to the mouth of Red River	49,000
Total	386,000

Maximum stage.

There are many important features of the flood regimen of the Mississippi River which bear upon the question of what constitutes a maximim stage for the entire Tensas Front, of which the following are some:

The division of the main flood-wave on the Yazoo Front into two parts, one passing down the river channel and the other through the Yazoo Bottoms; and the near proximity to the upper portion of the Tensas Front of two affluents of the size and importance of the White and Arkansas rivers.

The point of juncture of the flood-wave from these tributaries with the wave descending from Cairo, and its relation to the precedence, coincidence, or sequence of the crests, often give a maximum stage along the upper portion of the front, which is considerably anterior to that of the lower, while the more or less perfect conjunction, at the mouth of the Yazoo River, of the two portions of the original flood-wave, has its effect upon the stage of the river for a considerable distance above, as well as along the whole section of the Tensas Front lying below.

The following data, bearing upon the relation of stage and discharge of the Mississippi River at flood-stage, are taken from the results of the observations made by Assistant Engineer Homer P. Ritter:

Discharge observations at Hays' Landing, Miss.

(Homer P. Ritter, U. S. assistant engineer in charge.)

	January 21, 1882.	March 20, 1882, maximum stage.	March 29, 1882.	June 1, 1882, maximum discharge.
Gauge-reading ..... feet..	34.28	38.58	36.06	34.14
Water area.... square feet..	161,534	172,105	164,614	167,396
Width ..... feet..	2,710	2,820	2,756	2,707
Mean velocity...ft. per sec ..	6.06	5.44	5.56	6.26
Discharge....cu. ft. per sec..	978,300	936,900	914,800	1,049,000

These figures show that the reunion, at the mouth of the Yazoo River, of the two parts of the original flood-wave resulted in an increase of stage above, for a given discharge, or, viewed in relation to the maximum discharge, in rendering negative the increment of discharge for proportionate gauge heights, and in a retardation of the passage of the flood-wave.

As the maximum discharge did not occur at the maximum stage, the amount of escape from the river at said stage cannot be regarded as indicating the increment in gauge height which would occur if the escape were confined to the river under normal conditions; that is, where the propagation of the flood-wave is restricted to the river channel.

The following estimate of net escape is made for maximum stage:

	Cubic feet per second.
From the mouth of Cypress Creek to Ashton	150,000
From Ashton to Delta, La.....	300,000
From Delta, La., to the mouth of Red River.....	50,000
From maximum stage along the Tensas Front.....	500,000

TENSAS FRONT, FLOOD OF 1882.

Mouth of Cypress Creek to Louisiana State line.

[Observation by Hunter Stewart and J. B. Johnson.]

Locality.	Velocity.	Width.	Depth.	Coefficient.	Date of observation.	Outflow.
Estimate of overflow water from Cypress Creek and Mississippi River, flowing through the bottoms along the line of the Little Rock, Mississippi River and Tensas Railroad.....	.....	.....	.....	.....	Mar. 29	63,900
Gaines Landing.....	1.8	2,000	3.0	.7	Mar. 29	7,600
Below Gaines Landing	1.8	660	3.0	.7	Mar. 29	2,500
Below Gaines Landing (break in levee).....	.....	1,000	.....	.7	Mar. 29	.....
Below Gaines Landing.....	0.5	2,600	3.0	.7	Mar. 29	2,700
Do.....	Slack.	2,600	.....	.7	Mar. 29	.....
Above Point Comfort.....	0.66	10,000	3.0	.7	Mar. 29	14,000
Pastoria to Luna (four breaks)	1.5	1,000	1.0	.7	Mar. 29	10,000
Whisky Chute	1.0	330	3.0	.7	Mar. 30	700
Ford and Spears.....	7.0	450	2.0	.7	Mar. 30	4,400
Do.....	3.0	200	7.0	.7	Mar. 30	3,000
Rose Bank.....	0.8	330	3.5	.7	Mar. 30	600
Matthews Bend.....	1.0	330	1.0	.7	Mar. 30	200
Do.....	.....	.....	.....	.....	Mar. 30	8,000
Total.....	.....	.....	.....	.....	.....	117,600

Ashton to Delta, maximum stage.

[Observation by J. B. Johnson.]

FIRST ESTIMATE.

Locality.	Velocity.	Width.	Depth.	Coefficient.	Date of observation.	Maximum stage.	Date of break.	Outflow.
Ashton	0.75	15,000	4.0	.65	Mar. 20	Mar. 20	Old	29,000
Alsatia	10.0	165	12.0	.7	Mar. 21	Mar. 21	Mar. 21	14,000
Do	10.0	660	10.0	.7	Mar. 21	Mar. 21	Mar. 21	46,000
Salem to Rolla (six breaks)	4.0	1,980	12.0	.7	Mar. 21	Mar. 21	.....	67,000
Rolla to Mrs. Bell's (seven breaks)	4.0	1,320	4.0	.7	Mar. 21	Mar. 21	.....	15,000
Mrs. Bell's to Point (five breaks)	4.0	1,000	3.0	.7	Mar. 21	Mar. 21	.....	8,000
Montgomery to Burn's (two breaks)	4.0	330	2.0	.7	Mar. 21	Mar. 21	.....	2,000
Omega to Buckhorn (seven breaks)	4.0	3,600	8.0	.7	Mar. 21	Mar. 21	Mar.13,17	81,000
Milliken's Bend	5.0	1,300	8.0	.7	Mar. 21	Mar. 21	.....	36,000
Total	.....	.....	.....	.....	.....	.....	.....	298,000

SECOND ESTIMATE.

Locality.	Velocity.	Width.	Depth.	Coefficient.	Date of observation.	Maximum stage.	Difference of stage.	Date of break.	Outflow.
Ashton	0.75	15,000	2.0	.65	Mar. 30	Mar. 20	2.0	Old	15,000
Alsatia to Goodrich's (three breaks)	0.5	3,300	8.0	.7	Mar. 30	Mar. 21	4.0	Mar. 21	92,000
Above Edgemont (three breaks)	3.0	1,300	4.0	.7	Mar. 30	Mar. 21	4.0	.....	11,000
At Rolla's	3.0	480	4.0	.7	Mar. 30	Mar. 21	4.0	.....	4,000
Rolla to Mrs. Bell's (five breaks)	1.0	2,140	1.0	.7	Mar. 30	Mar. 21	.....	.....	2,000
Rolla to Mrs. Bell's (four breaks)	0.0	660	0.0	.....	Mar. 30	Mar. 21	.....	.....	.....
Mrs. Bell's to Willow Point (three breaks)	0.0	650	0.0	.....	Mar. 30	Mar. 21	.....	.....	.....
Willow Point to Delta	4.0	5,200	6.5	.7	Mar. 30	Mar. 21	1.5	.....	95,000
Total	.....	.....	.....	.....	.....	.....	.....	.....	219,000

Delta to Red River.

[Observation by Hunter Stewart and J. B. Johnson.]

Locality.	Velocity.	Width.	Depth.	Coefficient.	Date of observation.	Date of break.	Outflow.	Summation.
Upper side of Delta	4.0	1,200	2.0	.7	Apr. 1.	.....	3,400	3,400
Lower side of Delta	.....	.....	.....	.....	Apr. 1.	.....	— 3,400	
Below Delta (2 breaks)	1.5	250	4.0	.7	Apr. 1.	.....	1,000	
Vicinity of Brown and Johnson's (old break)	1.5	13,000	3.5	.7	Apr. 1.	.....	48,000	
Castleman's to Hico	2.0	17,500	4.0	.65	Apr. 1.	.....	91,000	140,000
Hico to Sargents	1.5	15,000	3.5	.65	Apr. 1.	.....	— 51,000	
Killakranka (3 breaks)	4.0	165	1.5	.7	Apr. 1.	.....	— 700	
Just below Killakranka	4.0	330	3.0	.7	Apr. 1.	.....	— 2,800	
Harper Bayou	7.0	200	24.0	.8	Apr. 1.	.....	— 27,000	
Between Harper Bayou and the ends of the levee	.....	430	.....	.....	.....	Mar. 13.	— 2,000	
Buckner's (2 breaks)	4.0	250	3.0	.7	Apr. 1.	.....	— 2,100	56,400

Delta to Red River—Continued.

Locality.	Velocity.	Width.	Depth.	Coefficient.	Date of observation.	Date of break.	Outflow.	Summation.
Point Pleasant	4.0	330	20.0	.7	Apr. 1.	.....	18,000	
Do	5.0	250	6.0	.7	Apr. 1.	.....	5,000	
Do	4.0	165	1.0	.7	Apr. 1.	.....	500	
Lower side of Point Pleasant	0.7	2,000	3.0	.7	Apr. 1.	.....	3,000	
								82,900
Buckridge	.....	2,600	2.5	.7	Apr. 1.	.....	— 3,200	
								79,700
Between Buckridge and Ship's Bayou	5.2	330	8.0	.7	Apr. 2.	Mar. 5.	9,600	
Half a mile above Hard Times	1.4	950	12.0	.7	Apr. 2.	.....	11,200	
Hard Times to Deshroon's	9.0	130	8.0	.7	Apr. 2.	.....	4,400	
Do	1.2	120	9.5	.7	Apr. 2.	.....	1,000	
Do	1.5	50	6.0	.7	Apr. 2.	.....	300	
Above Hardscrabble	3.3	250	9.0	.7	Apr. 2.	.....	5,200	
At Hardscrabble	5.0	330	8.0	.7	Apr. 2.	.....	9,200	
Bodnurant	3.0	330	7.5	.7	Apr. 2.	.....	5,200	
Kempe	.....	.....	.....	.....	Apr. 2.	Mar. 21.	1,200	
Water Proof, break in new levee	3.0	660	10.0	.7	Apr. 2.	Mar. 21.	13,900	
Water Proof break in old levee	6.0	400	8.0	.7	Apr. 2.	Mar. 21.	13,400	
Water Proof (3d break)	8.5	350	45.0	.7	Apr. 2.	Mar. 21.	93,700	
Hole in the Wall	1.3	260	3.0	.7	Apr. 3.	.....	700	
								248,700
Upper arm of Lake Concordia, over the levee and through breaks	2.5	35,000	1.0	.7	Apr. 3.	Mar. 24.	— 87,500	161,200
Lower arm of Lake Concordia	2.5	25,000	1.0	.7	Apr. 3.	Mar. 24.	62,500	223,700
From the end of the Henderson and Ashley levee to Grand Cut-off, 35 miles, at 5,000 cubic feet per second per mile—returning to river	1.0	175,000	1.0	.....	Apr. 3.	.....	—175,000	48,700

Examination of the right bank of the Mississippi River from the mouth of Red River to Donaldsonville, flood of 1882.

[Observation by Hunter Stewart.]

Locality.	Velocity.	Width.	Depth.	Coefficient.	Date of observation.	Outflow.	Summation.
Red River Landing	3.0	250	7.0	.7	Apr. 4.	3,700	
Do	2.0	100	6.0	.7	Apr. 4.	1,000	
							4,700
Hog Point	2.0	40	2.5	.7	Apr. 4.	200	
Do	1.0	130	5.0	.7	Apr. 4.	500	
Do	3.0	200	2.5	.7	Apr. 4.	1,000	
Do	2.0	150	5.0	.7	Apr. 4.	1,000	
Do	3.0	200	5.0	.7	Apr. 4.	2,100	
							9,500
Morganza—crevasse proper	4.5	800	22.0	.7	Apr. 5.	55,400	
Between channel of the crevasse and the ends of the levee	2.0	3,300	10.0	.7	Apr. 5.	46,200	111,100
Point Coupee	7.5	2,200	10.0	.7	Apr. 6.	115,500	226,600

Examination of the Arizona and Landry crevasses, Louisiana, flood of 1882.

[Observation by Hunter Stewart.]

Locality.	Velocity.	Width.	Depth.	Coefficient.	Date of observation.	Outflow.	Summation.
Arizona, Iberville Parish	10.0	1,000	4.0	.7	Apr. 7	28,000	
Landry, Ascension Parish	6.6	123	5.0	.7	Apr. 6.	3,000	
							31,000

4.—SAINT FRANCIS FRONT, THE YAZOO FRONT, AND A PORTION OF THE TENSAS FRONT, FOR FLOOD OF 1883.

(With an approximate determination of the discharge of the Saint Francis and Yazoo rivers, by Hunter Stewart, United States assistant engineer. Party of Hunter Stewart and Homer P. Ritter, United States assistant engineers.)

SCOPE OF WORK.

The work contemplated in the letter of instructions of February 25, consisted of an examination and an approximate determination of the amount of water escape from the Mississippi River over the following portions of its banks: The Saint Francis Front, or the right bank from Commerce, Mo., to Helena, Ark., the Yazoo Front, or the left bank from Horn Lake to Vicksburg, and the Tensas Front, or the right bank from the mouth of Cypress Creek to the mouth of Red River.

This was afterwards amended by the letter of instructions of March 13, which limited the examination of the Tensas Front to that portion of it which lies above Delta, La.

OUTFIT.

The steamer S. C. Baker, equipped with a single crew, was assigned for the service. The engineer force consisted of Messrs. Hunter Stewart and Homer P. Ritter, United States assistant engineers. I take pleasure in acknowledging the efficient and valuable services rendered by Mr. Ritter.

JOURNAL.

Monday, February 26, 1883: The party left Saint Louis on board the steamer S. C. Baker at 6 p. m.

Tuesday, February 27: This day was consumed in making the run from Carondelet to Daniel's Landing.

Wednesday, February 28: Arrived at Cairo at 8 a. m; coaled steamer. Left Cairo at 1 p. m., examined the right bank from the upper side of Bird's Point to the lower portion of Lucas Bend.

Thursday, March 1: The examination of the right bank was continued; that portion lying between the lower portion of Lucas Bend and Lazelle's Landing was gone over.

Friday, March 2: The portion of the Saint Francis Front situated between Lazelle's Landing and Osceola was resumed.

Saturday, March 3: Coaled steamer at Plum Point. The work extended from Osceola to Eldorado.

Sunday, March 4: The examination of the right bank was carried to Hopefield Point. Proceeded to Memphis, and telegraphed the office as per instructions. Found the river rising at Memphis; lay there the rest of the day.

Monday, March 5: Lay all the morning at Memphis. At 12 m., finding that the rise during the previous six hours was slight, left port at 1 p. m. Examined the right bank from Hopefield to Graves Bayou. Arrived at Norfolk Landing at 5 p. m.; ascertained that the river had risen 7 inches between the morning of the 3d and the morning of the 5th instant, and was continuing to rise. Lay at Norfolk Landing during the night.

Tuesday, March 6: Lay here all day, as the river continued to rise.

Wednesday, March 7: The rise at Norfolk Landing during the night of the 6th and 7th was but slight, and the news from Memphis indicated that the recent rise was caused by the outflow from the Saint Francis Basin. Examined the right bank from Graves Bayou to Ashley Point, and the left bank from Norfolk Landing to Mhoon's Landing.

Thursday, March 8: The right bank was examined from Ashley Point to the mouth of the Saint Francis River, and the left bank from Mhoon's Landing to Short Stop. The discharge of the Saint Francis River was measured at a point about $2\frac{1}{2}$ miles above its mouth.

Friday, March 9: The examination of the Saint Francis Front was completed. The section of the Yazoo Front comprised between Short Stop and Glendale was reconnoitered; the levees were followed systematically.

Saturday, March 10: The examination of the Yazoo Front was continued. The levees were followed from Glendale to Friars Point.

Sunday, March 11: The examination of the Yazoo Front was continued and carried to Sunflower Landing.

Monday, March 12: The examination of the Yazoo Front was continued. The crevasse at Gilchrist, 3 miles below Australia, was gauged. Inquiries concerning the state of the levees were made, and they were reported and found to be safe to Mound Place. The examination of the Tensas Front was commenced, and that portion situated between the mouth of Cypress Creek and Arkansas City was inspected, and the discharge along it gauged.

Tuesday, March 13: On the Yazoo Front the levee was reported and found to be

intact to Greenville. On the Tensas Front the examination was carried to Leland's

Wednesday, March 14: The Tensas Front was examined from Leland's to Wilson's Point. On the Yazoo Front the levees were safe.

Thursday, March 15: Coaled steamer. The Elleslie crevasses, on the Yazoo Front, were examined, and the examination of the Goodrich crevasse, on the Tensas Front, was commenced.

Friday, March 16: The examination of the Goodrich crevasse was completed. The levees on the right bank were reported intact to Delta; the Yazoo River was gauged; proceeded to Vicksburg, where orders were received to discontinue the work. The steamer S. C. Baker was turned over to the captain of the same, as per instructions.

METHODS OF OBSERVATIONS.

The method of observation varied with the character of the outlet. The channels may be classified as follows:

1. Over the natural surface of the bank.
2. Over the top of the levee.
3. Through a crevasse in the levee.
4. Through open streams.

(1.) *Over the natural surface of the bank.*—The mode of observing for this character of outlet is described in the report on the examination of the Saint Francis Front for the flood of 1882. No material change was made this year, with the exception of the omission of the measurement of the water flowing directly over points—that is, leaving the river on the upper side, to return immediately on the lower side, without any increase or diminution of volume. The action of the flood of 1882 indicated where this could be safely done.

(2.) *Over the top of the levee.*—For the determination of the discharge occurring over the top of the levee, frequent soundings were taken, the velocity was measured with the log, and the length of submergence with the stadia. When the distance was too great to be measured, or the bends in the levee or thickness of the underbrush prevented the use of the stadia, then the length of overflow was estimated. Whenever there was an important change either in the depth or the velocity of the escaping water, the distances applicable to the other elements of discharge were estimated. The depth and velocity for continuous submergence of the levee were found to remain very nearly uniform. This may be due to the fact that the levees were built to a grade which is, presumably, equal to the slope of the river at high water, and that there was but little variation in the fall of the water.

(3.) *Crevasse in the levee.*—The discharge of a crevasse was obtained by measuring its width with the stadia, its surface velocity with the log, and determining its mean depth by sounding a cross-section, the number of soundings varying with the size of the crevasse. There are in the tabulation two discharges which were not obtained by direct measurement or observation—the Horn Lake crevasses on the Yazoo Front, and the Luna crevasse on the Tensas Front. A personal inspection of these was omitted on account of the reliable information received concerning them.

(4.) *Open streams.*—In the case of small open streams, a cross-section was sounded, the soundings being placed approximately equidistant, the surface velocity was measured with the log, and the width was estimated.

In the gauging of the Saint Francis and Yazoo rivers, the soundings were located either with the stadia or with the transit, the velocity was obtained by means of rod-floats, and the width of the cross-section was determined by stadia measurement.

COMPUTATION.

The following formula is used in computing discharge:

$$Q = V \times W \times S \times C;$$

Wherein:

Q = discharge.
V = measured velocity.
W = width of cross-section.
S = mean depth of cross-section.
C = coefficient of reduction.

The following is a list of coefficients generally used in the computations:

For open streams, mean velocity = surface velocity × .8.

For crevasses and flow over the levee, mean velocity = surface velocity × .7.

For discharge over the bank, mean velocity = surface velocity × .7; and effective area = measured area × .9.

$$Q = V \times W \times S \times C, \text{ where, } C = .65,$$

In special cases other coefficients are used—for instance, for the escape in Beckwith's Bend (Saint Francis Front) .5 is used, owing to the great amount of drift

which was banked up against the timber, and in the computation of the discharge of the Yazoo River, a coefficient of .92 is used to reduce measured to mean velocity on account of the immersion of the rod-floats.

STAGE OF RIVER.

A table is given below of the relation of the stages of the floods of 1882 and 1883 from Cairo to Vicksburg; also the relation of the stage at which the observations were made to that of the maximum stage of this year, giving the respective dates.

Cairo to Vicksburg (flood stages).

Locality.	Date of observation flood of 1883.	Date of maximum stage, 1883.	Maximum stage, 1883, ref. maximum stage, 1882.		Observation stage, 1883, ref. maximum stage, 1883.	
			+	−	+	−
			Feet.	*Feet.*	*Feet.*	*Feet.*
Cairo, Ill	Feb. 28	Feb. 27	0.30	.....	.....	0.09
Widow Mercer's, Mo	Feb. 28	Feb. 27	0.33	.....	.....	0.08
O'Bryan's, Mo	Feb. 28	Feb. 27	0.58	.....	.....	.....
Belmont, Mo	Mar. 1	Feb. 27	0.48	.....	.....	0.27
Salmon's, Ky	Mar. 1	Feb. 28	0.33	.....	.....	.....
Hickman, Ky	Mar. 1	Feb. 26	0.32	.....	.....	.....
Saint James Bayou, Mo	Mar. 1	Feb. 27	0.46	.....	.....	.....
Lester's, Ky	Mar. 1	Feb. 28	0.50	.....	.....	.....
Donaldson's Point, Mo	Mar. 1	Feb. 28	0.33	.....	.....	.....
Morrison's Landing, Mo	Mar. 1	Mar. 1	0.25	.....	0.00	0.00
Toney's Landing, Mo	Mar. 1	Feb. 27	0.17	.....	.....	.....
Point Pleasant, Mo	Mar. 1	Feb. 28	0.33	.....	0.00	0.00
Batzell's Landing, Mo	Mar. 2	.....	.....	.....	.....	0.17
Cottonwood Point, Mo	Mar. 2	Feb. 28	0.17	.....	.....	0.15
Buckner's Landing, Mo	Mar. 2	Feb. 26	0.25	.....	.....	.....
Fulton, Tenn	Mar. 3	Mar. 1, 2	.....	0.54	0.00	0.00
Mouth Hatchee River, Tenn	Mar. 3	.....	.....	0.50	.....	.....
Randolph, Tenn	Mar. 3	.....	.....	0.50	.....	.....
Pecan Point, Mo	Mar. 3	Mar. 1	0.08	.....	.....	.....
Thomas Landing, Tenn	Mar. 3	Feb. 28	0.00	0.00	.....	.....
Redman's Landing, Mo	Mar. 4	Mar. 4	0.13	.....	0.00	0.00
Memphis, Tenn	Mar. 5	Mar. 6–8	.....	0.40	.....	0.05
Norfolk Landing, Miss	Mar. 7	Mar. 9	.....	0.58	.....	0.17
Commerce Landing, Miss	Mar. 7	.....	.....	0.42	.....	.....
Mhoon's Landing, Miss	Mar. 7	Mar. 7, 8	.....	0.60	0.00	0.00
Bordeaux Point, Miss	Mar. 8	Mar. 10	.....	0.67	.....	.....
Austin, Miss	Mar. 8	Mar. 8	.....	0.35	0.00	0.00
Helena, Ark	Mar. 10	Mar. 8, 9	.....	0.30	.....	0.05
Delta, Miss	Mar. 10	Mar. 6	.....	0.42	.....	0.05
Saint Louis Landing, Ark	Mar. 11	Mar. 10	0.04	.....	.....	.....
Sunflower Landing, Miss	Mar. 11	Mar. 10, 11	0.16	.....	0.00	0.00
Pushmataha, Miss	Mar. 12	.....	0.12	.....	0.00	0.00
Australia, Miss	Mar. 12	Mar. 10	0.04	.....	.....	0.25
Gilchrist's, Miss	Mar. 12	Mar. 10	0.04	.....	.....	0.30
Laconia, Ark	Mar. 12	Mar. 10	0.17	.....	.....	.....
Concordia, Miss	Mar. 12	.....	.....	0.33	.....	0.33
Cumbyville, Ark	Mar. 12	Mar. 9–12	.....	0.40	0.00	0.00
Riverton, Miss	Mar. 12	Mar. 11	.....	0.42	.....	0.08
Ozark Island, Ark	Mar. 12	Mar. 11	.....	0.33	.....	.....
Niblett's, Miss	Mar. 12	Mar. 10	.....	0.67	.....	0.12
Bolivar, Miss	Mar. 12	Mar. 10	.....	0.67	.....	.....
Catfish Point, Miss	Mar. 12	Mar. 11	.....	0.92	.....	0.04
Eutaw, Miss	Mar. 12	Mar. 8	.....	0.50	.....	.....
Mound Place, Miss	Mar. 12	Mar. 11	.....	1.08	0.00	0.00
Arkansas City, Ark	Mar. 12	Mar. 11	.....	0.75	.....	0.05
Gaines Landing, Ark	Mar. 13	Mar. 12	.....	0.40	.....	0.06
Llewellyn's, Ark	Mar. 13	Mar. 12	.....	0.58	0.00	0.00
Luna Landing, Ark	Mar. 13	Mar. 12	.....	0.58	0.00	0.00
Greenville, Miss	Mar. 13	Mar. 10–12	.....	1.32	.....	0.05
Leland's Ark	Mar. 14	Mar. 11	.....	0.80	.....	.....
Refuge, Miss	Mar. 14	Mar. 16	.....	1.17	.....	.....
Glenora, Miss	Mar. 14	Mar. 25	.....	0.50	.....	.....
Ross Landing, Ark	Mar. 14	Mar. 10	.....	1.17	.....	.....
Ashton, La	Mar. 14	Mar. 14	.....	1.00	0.00	0.00
Wilson's Point, La	Mar. 14	Mar. 14	.....	2.40	0.00	0.00
Lake Providence, La	Mar. 15	Mar. 11–14	.....	1.85	.....	0.05
Elleslie, Miss	Mar. 15	Mar. 14	.....	1.85	.....	0.05
Goodrich's, La	Mar. 16	.....	.....	2.50	0.00	0.00
Vicksburg, Miss	Mar. 16	Apr. 7	.....	4.95	.....	0.75

SAINT FRANCIS FRONT, COMMERCE, MISSOURI, TO HELENA, ARKANSAS. GENERAL DESCRIPTION OF OVERFLOW.

From Commerce, Mo., to within five miles of Bird's Point, there was no appreciable escape from the river. On the upper side of Bird's Point there was a large quantity of water leaving the river, the greater part of which returned between Bird's Point and O'Bryan's. A portion of O'Bryan's farm was above overflow. From O'Bryan's to the lower portion of Lucas Bend there was a large escape, while from the upper side of Belmont Point to nearly midway of Wolf Island chute there was considerable return flow. There was some escape in the lower portion of Wolf Island Chute, and quite a volume of water leaving the river in Beckwith's Bend, and there was a continuous return flow from chute of Island No 6 to the middle of the bend of Island No. 8. From the lower portion of the bend of No. 8 to the upper side of Donaldson's Point, a large escape took place, while there was a vast quantity of water returning to the river between Donaldson's Point and New Madrid. From a short distance below New Madrid to the head of Island No. 11, the bank was exposed; from Point Pleasant to Phillips' Landing the bank was overflowed; Ruddle's Point was exposed.

From Stewart's Landing to Craighead Point there was a continuous submergence of the natural bank, but there was not a movement in the overflow for all of the distance, owing to the action of the levees in the rear. In the vicinity of Gayoso there was a return flow during the maximum stage of the flood of 1883, while at the observation stage, and presumably at the maximum stage of the flood of 1882, there was an escape from the river. In the bend of Island No. 34 there were only three small crevasses. Morgan's Point was submerged on the upper side with no current in the overflow, the point itself was exposed, and on its lower side there was a slight submergence. There was no escape or return flow in the bend of No. 35. From Hampson and Ferguson's to Pecan Point the bank was mostly out of water. From Pecan Point down McGavock chute, and round the old bend of Island No. 37 to Viola Landing, the right bank was 2 feet out of water. From Viola Landing to Pacific Landing there was no overflow. From Turner's woodyard to Hopefield there was a continuous overflow. There was one break in the levee on the lower side of Hopefield Point, and another at about the middle of President's Island Bend, through both of which the water was flowing into the river.

At McConnell's Landing the land was mostly out of water, but where it was overflowed there was an escape taking place. From McConnell's to Reeves' the levee was not submerged. At Harris' and below Scanlan's, the overflow was stationary. In Cow Island Bend there was a slight escape, and the levee in the rear of Cat Island was intact. From Harcklerode's to Helena there was a continuous overflow. The Saint Francis River was gauged at a point about 2½ miles above its mouth, where the right bank was exposed.

The examination was closed by observing the movement of the overflow along the left bank of the Saint Francis from the location of the discharge section to its mouth.

RESULTS.

	Cubic feet per second.
Net escape or probable error, Commerce to New Madrid	45,000
Summation for section below New Madrid	
Escape to Phillips'	50,000
Return flow, vicinity of Stewart's Landing	10,000
Net escape at Batzell's Landing	40,000
Escape Batzell's to Island No. 14	90,000
Escape at Island No. 14	130,000
Return flow, Gayoso	95,000
Net escape, Gayoso	35,000
Escape, Bell's Point to Wright's Point	175,000
Net escape to Wright's Point	210,000
Return flow, Barfield	25,000
Net escape, Barfield	185,000
Escape from Barfield to Daniel's Point	48,000
Escape from Daniel's Point to Lanier's	78,000
Net escape at Lanier's	311,000
Return flow, Bend of No. 35	2,000
Net escape to Pecan Point	309,000
Escape, Fogelman's Chute to Hollybush Landing	64,000

	Cubic feet per second
Net escape at Hollybush Landing	373,000
Return flow, vicinity of Mound City	18,000
Net escape at Mound City	355,000
Escape, Mound City to Hopefield	58,000
Net escape at Hopefield	413,000
Return flow, Hopefield to McConnell's	17,000
Net escape above McConnell's	396,000
Escape, McConnell's to Graves Bayou	13,000
Net escape at Graves Bayou	409,000
Net escape between Graves Bayou and Excelsior P. O	24,000
Net escape at Council Bend	433,000
Return flow in Council Bend	76,000
Net escape at Johnson's Landing	357,000
Escape from Johnson's Landing to Walnut Bend	114,000
Net escape, head of Walnut Bend	471,000
Return flow, Walnut Bend	99,000
Net escape, foot of Walnut Bend	372,000
Return flow, Walnut Bend to mouth of Saint Francis River	139,000
Net escape at the mouth of Saint Francis River	233,000

The ridge on which New Madrid is situated was not covered either by the flood of 18-2 or by that of 1883. The town of New Madrid was submerged during both of these floods, but its site is not on the crest of the ridge. It has also been learned from reliable information of residents of this section that little, if any, overflow water escaped over or through this ridge into the lower section of the Saint Francis Bottoms. In view of this fact, taken in connection with the uncertainty of the escape of any overflow water through the depression between Big Prairie and the Commerce high land, the net escape of 45,000 cubic feet per second above New Madrid, as obtained from the observations, is not included in the summation of net escape for points below. In this connection there is another fact to be taken into account, which is, that the quantity of 45,000 cubic feet per second represents a very small probable error in the measurement, by such methods as were used, of 1,870,000 cubic feet per second, which is the arithmetical sum of the movement of overflow taking place over the bank of the river between Commerce and New Madrid.

SAINT FRANCIS RIVER.

	Cubic feet per second.
Measured discharge	373,000
Supply from the net escape from Mississippi River	233,000
Supply from other sources, or excess of discharge	140,000

The discharge of the Saint Francis River as given by the observations of March 8, 1883, is greatly in excess of its estimated discharge at the maximum stage of the flood of 1882, as made in the report upon the same.

The maximum stage of 1883, at the discharge section, was reported to be 1 foot below the maximum stage of 1882, and the reconnaissance of the Saint Francis during the flood of 1882 was made at a stage .8 foot below the maximum of that year, so that the actual stages of the two examinations were very nearly equal. The estimate of the discharge for 1882 was, to a certain extent, based upon the discharge observation made at Madison, as there was no available outfit for gauging the Saint Francis near its mouth; a section was sounded at about the same place where the discharge was observed in 1883, and the velocity was estimated by its apparent relation to the measured velocity at Madison.

The greater velocity of the river during the flood of 1883 was very noticeable.

The excess of the output of the Saint Francis over the net escape from the Mississippi River may represent the amount contributed by the tributaries of the Saint Francis, or these plus the error of the flood observations, or it may be due to the fact that the Saint Francis actually carried the escaping water at a more rapid rate owing to the comparatively low stage at its mouth.

The following table of change of stage shows that a very great amount of water

was discharged by the Saint Francis River, from whatever source it was received, for from March 1–9 the river oscillated .15 foot at Memphis, rose 2.5 feet at Mhoon's, and 3.3 feet at Helena. Thus after the crest of the flood-wave, as propagated down the river channel proper, had reached Memphis, and a fall had set in, the rise from the Saint Francis caused an increase of stage in the Mississippi as far above its mouth as Memphis.

Table of change of stage.

Date.	Memphis.		Mhoon's.		Helena.	
	Change.	Feet.	Change.	Feet.	Change.	Feet.
March 1	Rise.	0.05	Rise.	0.03	Rise.	0.15
2	Fall.	0.05	Rise.	0.16	Rise.	0.25
3	Stationary.	0.00	Rise.	0.14	Rise.	0.35
4	Stationary.	0.00	Rise.	0.72	Rise.	0.75
5	Rise.	0.10	Rise.	0.70	Rise.	1.05
6	Rise.	0.05	Rise.	0.40	Rise.	0.50
7	Stationary.	0.00	Rise.	0.30	Rise.	0.15
8	Stationary.	0.00	Rise.	0.05	Rise.	0.10
9	Fall.	0.15	Fall.	0.07	Stationary.	0.00

Saint Francis Front, 1883.—*Table of water escape of* 1883 *over that portion of the right bank of the Mississippi River forming the front of the Saint Francis Bottom (Commerce, Mo., to Helena, Ark.).*

[ABBREVIATIONS: V, surface velocity in feet per second. W, width, in feet, of the cross-section to which V and S are applied. S, soundings in feet. C, coefficients used to reduce V to mean velocity and to correct cross-section are for obstructions. Z, magnetic azimuth of the direction of the current. A, direction of current; f, from river; t, toward river; p, parallel. Q, escape in cubic feet per second; with minus sign it indicates return flow. Q″, net escape in cubic feet per second.]

Date.	No.	Locality.	V	W	S	C	Direction.		Q	Q″
							Z	A		
1883.							°			
Feb. 28	A	Above Railroad transfer							35,000	
28	1	Railroad transfer above Bird's Point.	1.6	6,400	9.5	.65	280	*f*	63,200	
28	2	Upper side of Bird's Point	3.3	5,000	11.0	.65	260	*f*	118,000	
										216,200
28	3	Above old Norfolk Landing	1.1	3,000	5.0	.65		*t*	—10,700	
28	4	Widow Mercer's	1.0	7,500	6.5	.65	205	*t*	—31,700	
28	5	1¼ mile below Norfolk Landing.	1.2	11,000	8.0	.65	280	*t*	—68,600	
28	6	Just above O'Bryan's	1.0	6,000	9.5	.65	S	*t*	—37,000	
										68,200
28	7	Just below O'Bryan's	3.3	5,600	9.0	.65	70	*f*	108,100	
28	8	Jarr's	2.5	9,700	7.0	.65	S	*f*	110,300	
28	9	Lower portion Lucas Bend	2.3	10,400	7.0	.65	345	*f*	108,800	
										395,400
Mar. 1	10	½ mile above Belmont	1.4	10,400	7.0	.65	275	*t*	—66,200	
1	11	½ mile below Belmont	0.6	7,500	4.5	.65	325	*t*	—13,200	
1	12	Upper portion Wolf Island Chute.	0.7	14,000	5.0	.65	S	*t*	—31,900	
										284,100
1	13	Middle of Wolf Island Chute.								
	14	Lower portion Wolf (over levee).	1.0	8,000	1.0			*f*	8,000	
1	15	Q. Beckwith's	2.5		9.0			*p*		
1	16	Farris Landing	1.7	6,000	4.0		75	*f*	26,500	
1	17	Middle of Beckwith's Bend.	1.5	10,000	10.0	.05		*f*	75,000	
1	18	Sam Parker's	1.6	8,000	4.0	.65	40	*f*	33,300	
										426,900
1	a18	Chute of Island No. 6	1.5	14,000		.65			—21,000	
1	19	Below foot of Island No. 6.	0.6	9,000	6.0	.65	25	*t*	—21,100	
1	20		0.8	12,500	5.5	.65	41	*t*	—35,800	
1	21		1.5	9,000	7.0	.65	45	*t*	—61,400	
1	22	Just above Saint James Bayou.	1.2	4,300	8.5	.65	25	*t*	— 8,500	
1	23	Saint James Bayou	1.3	110	3.4	.07	45	*t*	— 3,400	
1	24	Bend of No. 8	0.3	8,500	5.5	.65	S	*t*	— 9,100	
1	25	Middle of Bend No. 8	1.0	14,500	6.5	.65	29	*t*	—61,300	
										185,300

Saint Francis Front, 1883.—*Table of water escape of* 1883, *&c.*—Continued.

Date.	No.	Locality.	V	W	S	C	Direction.		Q	Q″
							Z	A		
							°			
1883.										
Mar. 1	26	Lower portion Bend No. 8..	2.0	12,960	6.5	.65	100	*f*	109,000	
1	27	Phillips'	0.8	11,400	5.5	.65	0	*f*	32,600	
1	28	Opposite Lester's	1.0	8,800	8.5	.65	74	*f*	48,600	
1	29	Opposite State line	1.4	5,300	6.5	.65	5	*f*	31,300	
1	30	Judge Riley's	2.6	4,100	7.0	.65	90	*f*	48,500	
										455,300
1	a30	Donaldson's Point	1.5	10,400	7.5	.65	.....	*t*	—76,100	
1	31	Attiberry's	1.0	8,900	7.5	.65	115	*t*	—43,400	
1	32	C. A. Lafarge	1.0	8,700	11.0	.65	101	*t*	—62,200	
1	33		1.0	11,800	13.0	.65	80	*t*	—99,700	
1	34	Morrison's	1.0	17,000	8.5	.65	55	*t*	—93,900	
1	a34	Saint John's Bayou	.....	.....	.....	.....	.....	*t*	— 8,000	
1	35	Little or Dry Bayou	2.1	50	18.0	.08	30	*t*	— 1,600	
1	a35	Vicinity of Dry Bayou	2.0	1,200	16.0	.65	30	*t*	—25,000	
1	b35	Town of New Madrid	Slack	.....	2.5	.....	.....	....	.....	
		Net escape or probable error above New Madrid.	.....	.....	.....	.....	.....	....	.....	45,400
1	36	Point Pleasant to Phillips'	1.1	15,000	4.5	.65	60	*f*	48,300	
1	37	Phillips'	1.7	500	2.5	.65	90	*f*	1,400	
										49,700
2	38	Above Cushion Lake Bayou	0.2	6,000	4.0	.65	350	*t*	— 7,800	
2	39	Cushion Lake Bayou	0.2	50	22.0	.08	20	*t*	— 200	
2	40	Stewart's Landing	0.5	1,500	4.0	.65	5	*t*	— 2,000	
										39,700
2	41	Batzell's Landing	1.3	.....	5.5	.....	50	*p*	.....	
2	42	.....	1.3	14,000	5.0	.65	30	*f*	59,100	
2	43	Above Islsnd No. 14	1.7	14,000	2.0	.65	20	*f*	30,900	
										129,700
2	44	Below Island No. 14	1.0	7,000	6.0	.65	115	*t*	—27,300	
2	45	Above Gayoso	0.8	5,000	9.0	.65	325	*t*	—23,400	
2	46	Bayou at Gayoso	2.3	250	11.0	.08	325	*t*	— 5,100	
2	47	Below Gayoso	2.0	6,000	5.0	.65	341	*t*	—39,000	
										34,900
2	48	Bell's Point	1.7	6,000	2.0	.65	26	*f*	13,300	
2	a48	Chute of Islands 16 and 17 (estimate).	.....	.....	.....	.....	.....	*f*	35,000	
2	49	Head of chute Island No. 18	Slack	.....	5.0	.....	.....	....	.....	
2	50	Chute of Island No. 18	Slack	.....	4.0	.....	.....	....	.....	
2	51	do	1.4	2,000	3.0	.65	71	*f*	5,500	
2	a51	Half-Moon Bayou	Slack	.....	.....	.....	.....	....	.....	
2	52	Foot of chute of Island No. 18.	1.5	500	3.0	.07	.....	*f*	1,600	
2	a52	Over levee	0.8	14,000	1.0	.07	.....	*f*	7,800	
2	b52	Jackson's Store to Midway	1.5	14,000	3.0	.65	.....	*f*	40,900	
2	53	Midway Landing	2.6	150	4.5	.07	57	*f*	1,100	
2	54	Below Hoffman's Landing	1.7	7,300	3.0	.65	46	*f*	24,200	
2	55	Hickman's Landing	1.3	9,500	2.5	.65	349	*f*	20,100	
2	56	Wright's Point	1.3	12,000	2.5	.65	300	*f*	25,400	
										209,800
2	57	Buckner's Landing	0.4	9,000	3.0	.65	4	*t*	— 7,000	
2	58	Barfield Landing	1.0	6,000	4.5	.65	285	*t*	—17,500	
										185,300
2	59	1½ miles below Barfield	1.3	6,000	4.0	.65	50	*f*	20,200	
2	60	O'Donnel's Landing	Slack	.....	4.0	.....	.....	....	.....	
2	61	Canadian Reach	1.4	5,200	7.5	.65	76	*f*	35,500	
										241,200
2	62	1¼ mile above Daniel's Point	0.7	6,000	3.0	.65	255	*t*	—8,200	
										232,200
2	63	Fletcher's Landing	0.7	8,600	4.5	.65	109	*f*	17,600	
2	63*a*	Below Elmot	1.5	9,500	2.5	.65	.....	*f*	23,200	
3	64	Sans Souci	2.8	100	2.0	.7	45	*f*	400	
3	*a*	Vicinity of Tanzas Landing	1.5	4,000	1.0	.7	45	*f*	4,200	
3	*b*	Craighead Point	1.5	10,000	3.0	.65	.....	*f*	29,300	
3	65	Lanier's	2.7	550	3.0	.7	35	*f*	3,100	
										310,600
3	66	Preston's Landing	1.0	1,000	1.0	.65	.....	*t*	—600	
3	67	Hampson's	0.2	4,000	2.0	.65	28	*t*	—1,000	
										309,000
3	71	Just above Turner's wood-yard.	0.3	7,500	2.0	.65	30	*f*	2,900	
3	72	Middle of Fogelman's Chute	1.2	9,000	1.5	.65	89	*f*	10,500	
3	73	Foot of Fogelman's Chute	1.3	7,500	2.5	.65	25	*f*	13,700	
										336,100
4	74	Eldorado	Slack	.....	.....	.....	.....	....	.....	
4	76	James'	Slack	.....	3.5	.....	.....	....	.....	
4	77	Stroutman's	0.8	11,500	3.5	.65	57	*f*	20,900	
4	78	Hollybush Landing	0.7	24,000	1.5	.65	346	*f*	16,400	
										373,400

Saint Francis Front, 1883.—*Table of water escape of* 1883, *&c.*—Continued.

Date.	No.	Locality.	V	W	S	C	Direction. Z	Direction. A	Q	Q″
1883.							°			
Mar. 1	79	Bayou at Mound City.....	2.7	150	22.0	.8	251	*t*	—7,100	
4	80	.....do	0.9	100	6.0	.8	250	*t*	—400	
4	81	Above Mound City (over levee).	.....	7,500	.....	.....	.....	*t*	—7,500	
4	....	Break in levee.....	1.0	200	5.5	.7	290	*t*	—800	
4	81*a*	Below Mound City (over levee).	.....	2,500	.....	.....	.....	*t*	—2,500	
										355,100
4	82	Lower end Chicken Island Chute.	2.6	3,500	1.0	.7	330	*f*	6,400	
4	83	Upper side of Hopefield Point.	1.2	12,000	5.5	.65	355	*f*	51,500	
										413,000
4	84	.....do	1.7	5,000	3.0	.65	175	*t*	—16,600	
										396,400
5	85	Hopefield Point	0.7	3,300	3.0	.65	.....	*f*	4,500	
										400,900
5	86	Upper portion President's Island Bend.	2.9	300	4.5	.7	328	*t*	—2,700	
5	87	Middle of President's Island Bend.	0.6	1,200	4.0	.65	315	*t*	—1,900	
										396,300
5	88	Lower portion of President's Island Bend.	1.0	3,500	1.0	.7	.....	*f*	2,500	
5	89	11½ miles above Reeve's Landing.	Slack	.....	.....	.....	.....	....	.....	
5	90	Harris' Landing	Slack	.....	.....	.....	.....	....	.....	
5	91	Scanlan's Landing.....	Slack	.....	.....	.....	.....	....	.....	
5	92	Cow Island Bend	0.6	4,200	1.5	.65	150	*f*	2,500	
5	93	Vicinity of Graves Bayou ..	0.8	7,400	2.0	.65	192	*f*	7,700	
										409,000
7	94	Harckelrode's	1.3	300	2.0	.7	.....	*t*	—500	
7	95	Horseshoe Lake Bayou	2.0	200	10.0	.8	321	*t*	—3,200	
7	96	Below Bayou	1.5	8,000	2.0	.65	317	*t*	—15,600	
										389,700
7	96*a*	4 miles levee.....	.....	.....	.....	.....	.....	*f*	40,000	
7	97	Excelsior Post-office	0.3	7,000	2.5	.65	130	*f*	3,400	
										433,100
7	98	Council Bend	1.0	9,800	7.0	.65	.....	*t*	—44,600	
7	99	.....do	0.8	8,800	4.0	.65	.....	*t*	—18,300	
7	100	.....do	0.5	8,200	5.0	.65	.....	*t*	—13,300	
										356,900
7	101	1 mile above Johnson's Landing.	Slack	.....	.....	.....	.....	....	.....	.....
7	102	Johnson's Landing	1.3	5,000	6.0	.65	.....	*f*	25,300	
7	102*a*	Peters	.....	.....	.....	.....	.....	....	18,000	
7	103	Upper side Ashley Point...	1.7	16,000	4.0	.65	.....	*f*	70,700	
										470,900
8	104	Walnut Bend.....	1.1	5,000	7.0	.65	.....	*t*	—25,000	
8	105	.....do	1.3	5,500	7.5	.65	.....	*t*	—34,900	
8	106	.....do	0.5	6,000	6.5	.65	.....	*t*	—12,700	
8	107	.....do	0.8	4,500	7.0	.65	.....	*t*	—16,400	
8	107*a*	.....do	1.0	300	9.0	.7	.....	*t*	—1,900	
8	108	.....do	1.0	2,500	5.0	.65	.....	*t*	—8,100	
										371,900
8	109	.....do	Slack	.....	5.5	.....	.....	....	.....	
8	110	.....	0.6	6,500	5.0	.5	.....	*f*	8,800	
										380,700
8	111	Harding's Point, crossing point from upper side.	1.0	.....	6.5	.....	.....	....	.....	
8	112	Upper portion Saint Francis Bend.	1.0	9,000	7.5	.65	.....	*t*	—18,300	
8	112*a*	Chute of Saint Francis Island.	0.3	250	20.0	.8	.....	*t*	—1,200	
8	112*b*	Saint Francis Bend	0.5	8,000	7.0	.65	.....	*t*	—18,200	
8	113	.....do	1.2	4,000	8.5	.65	.....	*t*	—26,500	
8	114	1½ miles above mouth Saint Francis.	1.2	8,600	8.0	.65	.....	*t*	—53,700	
										232,800
9	115	From the discharge section of the Saint Francis River, located 2½ miles above its mouth to the mouth, observations taken over the left bank of the Saint Francis River.	1.0	5,000	5.5	.65	.....	*f*	17,900	250,700
9	116		0.9	2,000	6.0	.65	.....	*t*	—7,000	
9	117		1.4	2,000	6.0	.65	....	*t*	—10,900	232,800
		Net escape from New Madrid exclusive of the amount of overflow water returned by the Saint Francis River.	.....	.....	.....	.....	.....	....	.....	233,000

Discharge of the Saint Francis River, March 8, 1883.

Partial cross-section areas, square feet.	Measured velocity, feet per second.	Partial discharge, cubic feet per second.
11, 660	11. 5	134, 090
15, 360	10. 0	153, 600
13, 420	8. 7	116, 754
7, 380	8. 3	61, 254
47, 829	.....	465, 698

Coefficient to reduce measured velocity to mean velocity, .8; true discharge, 465,698 + .8=373,000 cubic feet per second; cross-section area, 47,820 square feet; width, 835 feet; mean depth, 57.3 feet; mean velocity, 7.8 feet per second. Stage (maximum of 1883) 1 foot below high water, 1882.

The discharge section was located at the Smiley Plantation about 2½ miles above the mouth of the Saint Francis River. The right bank was out of water and the left bank was covered two (2) feet deep. The base line was located on the left bank and was 300 feet long, measured by stadia. Two parallel range lines were located by the prismatic compass. The angle of the discharge section and base line was 89° 30′.

Four rod-floats with 10 feet immersion were run; the time was taken with an ordinary watch. The positions of soundings and their distances were measured by stadia.

YAZOO FRONT.

There were two breaks in the Horn Lake levee which were of the same dimensions as those that occurred during the flood of 1882. These had been roughly repaired by the inhabitants after the subsidence of the flood of last year, but the new work was washed away by the high water of this year. The output was small, and capable of being cared for by the local drains, until thriver oveer flowed the bank between Harklerode's and Star Landing, when it was backed up and overflowed a considerable portion of the De Soto Front. These breaks were not visited, and the estimate of their discharge was made from information received.

A portion of the unleveed bank between Norfolk and Star Landings was barely covered, with no appreciable current in the overflow. This fact will account for the discrepancy in the widths of "outlet for overflowed banks" that exists in the tabulated results of the floods of 1882 and 1883.

The following facts were obtained concerning the action of the river at Norfolk Landing during the high water of February and March, 1883. From February 28 to March 2 the river was stationary; March 2 and 3 there was a slight fall; from 9 a. m. March 3, to 9 a. m. March 5, there was a rise of seven (7) inches; March 5 to 7 there was a continuation of the rise; the exact amount was not measured; March 7 to 9 there was a rise of two inches, the flood reaching its maximum on March 9. These data, taken in connection with the gauge-readings at Memphis, Mhoon's, and Helena, show the effect of the return flow from the Saint Francis bottoms.

From a short distance below Star Landing to 2½ miles below Commerce, the levee was intact, and for the greater part of this stretch almost entirely exposed on both sides.

The levees were followed from Cmomerce to Hulberton, or Hughes, with the following results: From 2½ miles below Commerce to 1 mile below Mhoon's Landing there were 49 outlets through which the water was escaping from the river; from 1 mile below Mhoon's to McKinney Bayou (inclusive) there were 11 inlets through which the water was returning to the river; from McKinney Bayou to Glendale there were 45 outlets and 1 inlet, and from Glendale to 2 miles above Hulberton there were 29 outlets.

From Hulberton to 2 miles above Sunflower Landing the levees were intact, but a portion of this tract was submerged by water that escaped above.

The overflow water in the gap of 2 miles just above Sunflower Landing was sounded and found to have no appreciable current. There were reported two crevasses in the levee which joins the line of the second Mississippi levee district with the Totten Ridge. These were not visited, as the water escaping through them had already been gauged.

From Sunflower Landing to the end of the second levee district there were only two localities where the levee had given way; *i. e.*, at Gilchrist's, a short distance below Australia, there was one crevasse, and at Elleslie, opposite Lake Providence, there were three crevasses. These were visited and gauged.

The Yazoo River was ganged at a section a few hundred yards below the debouchure of Steele Bayou.

RESULTS.

The detailed estimates for the discharge of all outlets will be found in the tabulation, which gives:

1. The approximate location of the outlet.
2. The character of the outlet.
3. The surface velocity of the water.
4. The width of the outlet.
5. Mean depth of outlet.
6. Coefficient of reduction.
7. Date of observation.
8. Stage of water at the date of observation, referred to the maximum of 1883.
9. Stage of water at the date of observation, referred to the maximum of 1882.
10. Direction of flow.
11. Discharge and partial summation of discharges, in cubic feet per second.
12. Net discharge, in cubic feet per second.

GENERAL SUMMATION.

	Cubic feet per second.
Escape between Horn Lake and Star Landing	13,000
Escape Commerce to Mhoon's	137,000
Escape to Mhoon's	150,000
Return flow, Mhoon's to McKinney Bayou	48,000
Net escape to McKinney Bayou	102,000
Escape between McKinney Bayou and Short Stop	38,000
Escape between Short Stop and Glendale	151,000
Net escape at Glendale	291,000
Escape Glendale to Friar's Point	158,000
Escape Friar's Point to Hughes	64,000
Net escape at Hughes	513,000
Escape at Gilchrist's	26,000
Net escape at Gilchrist's	539,000
Escape at Elleslie	7,000
Net escape into the Yazoo Bottoms	546,000

Widths of outlets.—The table of summation of the width of overflow is made for comparison with a similar table in Mr. J. B. Johnson's report on the Yazoo Front for the flood of 1882.

The increase in the width of the overflow taking place over the levee is due to the fact that the examination of this year was made at a stage as near the maximum as was practicable, while the observation stage of the flood of 1882 was about 1 foot below the maximum, and there was a consequent omission of considerable portions that were submerged at the higher stage.

The smaller distance given by the summation of the widths of crevasses is due to the closure of the breaks and the permanence of the line in the second levee district.

Table of widths of overflow, Yazoo Front, 1883.

Locality.	Movement of overflow.	Kind of outlet.			Total submergence.	
		Over bank.	Over levee.	Through crevasses.	Feet.	Miles.
		Feet.	*Feet*	*Feet.*		
Horn Lake to Mhoon's	Escape	9,700	3,500	8,700	21,900	4.1
Mhoon's to McKinney Bayou	Return flow	.....	13,800	1,400	15,200	2.9
McKinney Bayou to Glendale	Escape	800	11,500	9,200	21,500	4.0
Glendale to Friar's Point	Escape	.....	.....	3,500	3,500	0.7
Friar's Point to Hughes	Escape	.....	1,700	3,600	5,300	1.0
Sunflower Landing	Stationary	10,500	.....	.....	10,500	2.0
Gilchrist and Elleslie	Escape	.....	.....	800	800	0.2
Total	.....	21,000	30,500	27,200	78,700	14.9
Total in miles	.....	4	5.8	5.1	14.9	

Table of water escape of the flood of 1883 *over that portion of the left bank of the Mississippi River forming the front of the Yazoo Bottoms from Bull's Head to the mouth of the Yazoo River.*

[ABBREVIATIONS: V, surface velocity, in feet per second. W, width in feet of the cross-section to which V and D are applied. D, mean depth of the cross-section, in feet. C, coefficient of reduction. A, direction of flow; inflow refers to the water flowing into the Yazoo Bottoms from the Mississippi River; outflow refers to the water returning to the river. O, observation stage referred to the maximum stage of 1883. O′, observation stage referred to the maximum stage of 1882. Q, escape from the river, in cubic feet per second; with minus sign it indicates return flow. Q″, net escape, in cubic feet per second.

Date.	Locality.	Outlet.	V	W	D	C	O	O′	A	Q	Q″
1883.											
Mar. 7	Horn Lake Levee	Two crevasses	3.0	270	3.0	.7			Inflow	1,700	
7	Norfolk Landing						—.2	—.75	do		
7	Harklerode's	Crevasse	4.0	150	4.0	.7			do	400	
7	From Harklerode's to Star Landing	Over bank	1.0	5,000	1.5	.65			do	4,900	
7	do	do	0.7	3,500	2.5	.65			do	4,000	
7	do	do	1.5	1,200	1.5	.7			do	1,900	
7	From 2½ miles below Commerce to Mhoon's Landing.	Over levee	2.0	600	0.5	.7			do	400	12,900
7	do	Crevasse	3.0	100	10.0	.7			do	2,100	
7	do	do	3.0	30	4.0	.7			do	300	
7	do	do	3.2	120	5.0	.7			do	1,300	
7	do	do	3.5	125	4.0	.7			do	1,200	
7	do	do	3.5	40	3.0	.7			do	300	
7	do	do	3.3	250	5.0	.7			do	2,900	
7	do	do	3.1	250	5.0	.7			do	2,700	
7	do	do	3.0	410	5.5	.7			do	4,700	
7	do	do	2.3	40	5.0	.7			do	300	
7	do	do	2.0	100	4.0	.7			do	600	
7	do	do	2.0	195	3.0	.7			do	800	
7	do	do	3.6	50	7.0	.7			do	900	
7	do	Over levee	2.0	330	0.5	.7			do	200	
7	do	Crevasse	4.6	130	6.0	.7			do	2,500	
7	do	Over levee	4.0	1,640	0.5	.7			do	2,300	
7	do	Crevasse	4.3	100	5.0	.7			do	1,500	
7	do	do	5.0	80	4.5	.7			do	1,300	
7	do	do	4.0	66	6.0	.7			do	1,100	
7	do	do	4.5	200	6.0	.7			do	3,800	
7	do	Over levee	3.4	410	0.3	.7			do	300	
7	do	Crevasse	3.0	55	6.5	.7			do	800	
7	do	do	3.8	30	14.0	.7			do	1,100	
7	do	do	4.2	30	12.0	.7			do	1,100	
7	do	do	4.0	630	4.0	.7			do	7,100	
7	do	do	3.8	170	6.0	.7			do	2,700	
7	do	Three crevasses	3.5	250	6.0	.7			do	3,700	
7	do	Crevasse	3.3	30	7.0	.7			do	500	
7	do	do	4.0	130	6.0	.7			do	2,200	

7	do	do	4.0	180	5.5	.7	do	2,800		
7	do	do	3.7	65	6.0	.7	do	1,000		
7	do	do	4.0	15	6.0	.7	do	300		
7	do	do	4.7	80	6.5	.7	do	1,700		
7	do	do	4.7	165	5.0	.7	do	2,700		
7	do	do	4.2	460	7.0	.7	do	9,500		
7	do	do	4.7	145	7.5	.7	do	3,600		
7	do	do	5.0	40	7.0	.7	do	1,000		
7	do	do	5.0	25	8.0	.7	do	700		
7	do	do	3.2	460	5.0	.7	do	5,200		
7	do	do	2.8	245	6.5	.7	do	3,100		
7	do	do	2.7	30	6.0	.7	do	300		
7	Mhoon's Landing	do	4.8	880	7.0	.7	↕.00 —.60 do	20,700		
7	Vicinity of Mhoon's Landing	do	4.2	1,250	6.0	.7	do	22,000		
7	do	do	4.0	430	7.0	.7	do	8,400		
8	do	do	5.1	235	3.5	.7	do	2,900		
8	do	Over levee	2.0	480	0.5	.7	do	300		
								149,800		
8	From 1 mile below Mhoon's Landing to McKinney Bayou.	do	3.0	230	0.5	.7	Outflow	— 2,400		
8	do	do	3.5	720	0.5	.7	do	— 900		
8	do	do	3.0	7,500	1.0	.7	do	—15,800		
8	do	Crevasse	4.3	660	2.5	.7	do	— 5,000		
8	do	Over levee	2.0	1,950	2.0	.7	do	— 5,500		
8	do	do	2.7	670	0.3	.7	do	— 400		
8	do	Crevasse	3.7	130	3.0	.7	do	— 1,000		
8	do	Over levee	3.0	410	1.0	.7	do	— 900		
8	do	Crevasse	4.0	295	3.0	.7	do	— 2,500		
8	do	Over levee	3.0	2,300	0.8	.7	do	— 3,900		
8	McKinney Bayou	Bayou	2.7	330	15.0	.7	do	— 9,400		
								102,100		
8	McKinney Bayou to Austin	Over levee	2.1	30	2.0	.7	Inflow	100		
8	do	do	2.0	1,070	1.5	.7	do	2,200		
8	do	do	2.0	2,000	1.0	.7	↕.00 —.35 do	2,800		
8	do	Crevasse	2.0	360	15.0	.7	do	7,600		
8	do	do	2.0	120	12.5	.7	do	2,100		
8	At Austin	do	3.1	260	15.0	.7	do	8,500		
8	From Austin to Short Stop	do	3.1	100	8.0	.7	do	1,700		
8	do	do	3.4	80	5.0	.7	do	1,000		
8	do	Over levee	2.0	410	0.5	.7	do	300		
8	do	Crevasse	2.8	130	30.0	.7	do	7,600		
9	Short Stop to Sunflower Lake	do	3.5	200	8.5	.7	do	4,200		
								140,200		
9	At Ridge	do	1.0	80	3.0	.7	Outflow	—200		
								140,000		
9	do	do	3.9	20	6.0	.7	Inflow	300		
9	do	do	4.0	90	7.0	.7	do	1,800		
9	do	do	4.0	115	7.0	7	do	2,300		
9	do	do	4.0	80	6.5	.7	do	1,500		
9	do	do	4.7	30	8.0	.7	do	800		
9	do	do	5.0	30	7.0	.7	do	700		
9	Back of Sunflower Lake	Three crevasses	2.0	995	35.0	.7	do	48,800		

Table of water escape of the flood of 1883, *&c.*—Continued.

Date.	Locality.	Outlet.	V	W	D	C	O	O′	A	Q	Q″
1883.											
Mar. 9	Sunflower Lake to Trotter's	Crevasse	3.1	375	9.0	.7			Inflow	7,300	
9	do	do	2.4	85	13.0	.7			do	1,900	
9	do	do	1.2	1,640	3.3	.7			do	4,500	
9	do	do	2.2	130	9.0	.7			do	1,800	
9	do	do	2.0	80	6.0	.7			do	700	
9	do	do	2.0	115	13.0	.7			do	2,100	
9	do	Over levee	2.2	1,150	1.5	.7			do	2,700	
9	do	Crevasse	4.2	235	6.0	.7			do	4,100	
9	do	Over levee	2.0	655	1.0	.7			do	900	
9	do	Two crevasses	3.0	440	10.0	.7			do	9,200	
9	do	Over levee	1.0	1,150	1.0	.7			do	800	
9	do	Crevasse	5.1	330	5.5	.7			do	6,500	
9	do	do	3.0	655	2.5	.7			do	3,400	
9	do	do	3.2	330	2.0	.7			do	1,500	
9	do	do	1.0	165	15.0	.7			do	1,700	
9	do	Over levee	1.0	655	1.5	.7			do	700	
9	do	Crevasse	2.3	345	3.0	.7			do	1,700	
9	do	do	0.8	165	30.0	.7			do	2,800	
9	do	Over levee	1.0	655	1.5	.7			do	700	
9	do	Crevasse	4.0	195	4.0	.7			do	2,200	
9	do	Over levee	3.5	2,500	2.5	.7	‡.00	—.35	do	15,300	
9	Trotter's field	Levee caved	3.0	800	4.5	.7			do	7,600	
9	From Trotter's to Glendale	Over levee	1.0	2,000	0.5	.7			do	700	
9	do	Crevasse	4.0	30	4.0	.7			do	300	
9	do	do	4.0	50	5.0	.7			do	700	
9	do	do	3.7	175	4.0	.7			do	1,800	
10	do	do	2.7	270	24.5	.7	—.05	—.35	do	12,500	
											291,300
10	Glendale	do	6.3	564	10.5	.7			do	26,100	
10	From Glendale to Friars Point	do	7.0	215	26.0	.7			do	27,400	
10	T. C. Ferguson's (broke March 5, 1883)	do	6.5	525	26.0	.7			do	62,100	
10	do	do	7.0	210	10.5	.7		—.47	do	10,800	
10	do	do	2.0	475	10.0	.7			do	6,600	
10	do	do	1.7	130	9.5	.7			do	1,500	
10	do	do	1.5	310	10.5	.7			do	3,400	
10	do	do	3.0	310	9.0	.7			do	5,600	
10	1 mile above Friars Point (broke March 5, 1883)	do	3.4	780	8.0	.7			do	14,900	
											449,700
11	From Friars Point to Island No. 63	do	5.0	165	11.0	.7			do		
11	do	do	2.4	335	7.5	.7			do		
11	do	do	2.0	270	9.5	.7			do		
11	do	do	2.0	270	10.0	.7			do	24,400	
11	do	do	4.0	270	8.5	.7			do		
11	do	Over levee	2.0	65	0.3	.7			do		

11	.....do	.....do	2.0	165	0.5	.7			....do	100	
11	.....do	.....do	2.0	100	1.0	.7			....do	100	
11	.....do	Crevasse	4.0	110	3.0	.7			...do	1,000	
11	.....do	Over levee	2.0	330	0.3	.7			....do	100	
11	.....do	.....do	2.0	330	0.5	.7			....do	200	
11	.....do	Crevasse	3.0	390	2.0	.7			....do	1,600	
11	.....do	.....do	3.4	210	14.0	.7			....do	7,000	
11	.....do	Over levee	2.0	330	0.5	.7			... do	200	
11	.....do	Crevasse	5.0	105	7.0	.7			....do	2,600	
11	..... do	..... do	5.3	135	7.0	.7			... do	3,500	
11	.....do	Over levee	2.0	425	0.5	.7			....do	300	
11	.....do	Crevasse	3.2	335	5.0	.7			....do	3,800	
11	.....do	..... do	3.2	195	11.0	.7			....do	4,600	
11	.....do	.....do	3.0	195	5 0	.7			....do	2,000	
11	.....do	.....do	4.0	185	13.0	.7			... do	6,700	
11	.....do	.....do	4.2	165	4.0	.7			... do	1,900	
11	Back of Island No. 63	.....do	2.9	285	7.0	.7			....do	4,000	
										———	514,000
11	Gap in levee above Sunflower Landing (2 miles)	Levee caved	Slack	10,500	5.5	.7	—.00	†.16	Slack		
12	Gilchrist place, 3 miles below Australia	Crevasse	5.0	310	23.5	.7	—.33	—.30	Inflow	25,500	
										———	539,500
15	Elleslie	.....do	3.0	160	4.5	.7	—.05	—.19	... do	1,500	
15	.....do	.....do	7.5	165	3.0	.7			....do	2,600	
15	.....do	.....do	8.0	155	3.0	.7			....do	2,600	
										———	546,200

Discharge of the Yazoo River, March 16, 1883—2 p. m.

Locality.	Number.	Partial areas, square feet.	Measured velocity, feet per second.	Mean velocity, feet per second.	Discharge, cubic feet per second.
Left bank	1	15,640	1.52	1.40	21,900
Do	2	18,690	1.54	1.42	26,500
Do	3	12,920	1.00	1.00	12,900
Right bank					
Total		47,250			61,300

Effective width of cross-section, 773 feet; area of cross-section, 47,250 square feet; mean depth, 61.1 feet; mean velocity, 1.3 feet per section; coefficient to reduce observed velocity to mean, .92; discharge, 61,300 cubic feet per second.

The discharge section was located 15 miles, approximately, above the mouth of the Yazoo River and just below the junction of Steele Bayou.

The base line was located on the left bank at E. Corwent's Plantation; the right bank was submerged 6 feet, and the left bank was exposed 6½ feet.

The stage of the Yazoo was reported to be 8 feet, approximately, below the high water of 1882.

The velocity was measured by means of rod-floats immersed 15 feet, timed by an ordinary watch; locations were made with a transit; distances were measured with stadia.

TENSAS FRONT.

The Mississippi River front of the Tensas Bottom extends from Cypress Creek to Red River.

The examination of the flood was made only as far as Delta, La., for reasons before mentioned.

As the instructions stated explicitly that the work was to commence at Cypress Creek, no effort was made to obtain an estimate of the amount of water on the bottoms between the hills and the mouth of Cypress Creek, a distance of 5 miles in an air line. Such an estimate may be of importance, for although it is only in exceptional cases that the Mississippi River contributes, still there is a considerable inflow over this portion of the front tributary to the Tensas bottoms, and, were it protected against overflow, all of the water that now escapes would become tributary to the Mississippi.

RESULTS.

The overflow water in the Tensas Bottom for the portion examined was reported to be relatively higher than in 1882.

At Arkansas City the high water of 1883 was .7 foot lower than the high water of 1882, while the height of the water in the rear of the levee was .5 foot lower than in 1882. At Goodrich's the high water of 1882 was 2.5 feet higher than the high water of 1883, while the depth of the overflow on the plantation was, in 1882, only 1.5 feet greater than in 1883.

The estimates for the discharge of all outlets will be found in the tabulation, which gives the same details as are mentioned in the section on the Yazoo Front.

GENERAL SUMMATION.

	Cubic feet per second.
Flow into the river from Wilburn's to ——	3,000
Escape, to 2 miles below Chicot	44,000
Net escape, to 2 miles below Chicot	41,000
Return flow, from 2 miles below Chicot to the Gordon Place	48,000
Net flow into the river at Gordon's	7,000
Escape, Gordon's to Llewellyn's	84,000
Net escape at Llewellyn's	77,000
Return flow, Llewellyn's to Linwood	6,000
Net escape at Linwood	71,000
Escape at Luna	31,000
Escape at Whiskey Chute	3,000
Escape at Ashton	24,000
Escape at Goodrich's	59,000
Net escape at Goodrich's	188,000

Table of water escape of the flood of 1883 *over that portion of the right bank of the Mississippi River, forming the front of the Tensas Bottoms, from the mouth of Cypress Creek to Delta, La.*

[ABBREVIATIONS: V, surface velocity in feet, per second. W, width in feet of the cross-section to which V and D are applied. D, mean depth of the cross-section, in feet. C, coefficient of reduction. A, direction of flow; inflow refers to the water flowing into the Tensas Bottoms from the Mississippi River; outflow refers to the water returning to the river. O, observation stage referred to the maximum stage of 1883. O′, observation stage referred to the maximum stage of 1882. Q, escape from the river, in cubic feet per second; with minus sign it indicates return flow. Q″, net escape in cubic feet per second.]

Date.	Locality.	Outlet.	V	W	D	C	O	O′	A	Q	Q″
1883.											
Mar. 12	From Wilburn's to Sappington's	Over levee	2.0	650	0.5	.7			Outflow	—500	
12	do	Crevasse	1.0	260	6.0	.7			do	—1,100	
12	do	do	1.0	260	0.5	.7			do	—100	
12	do	Over levee	1.0	320	0.5	.7			do	—100	
12	do	Crevasse	0.7	230	11.0	.7			do	—1,200	
12	do	Over levee	0.7	360	0.3	.7			do	—100	
											—3,100
12	do	Crevasse	Slack.	100	6.0				Slack		
12	do	Over levee	1.0	660	0.3	.7			Inflow	100	
12	do	Crevasse	2.0	50	4.5	.7			do	300	
12	do	do	2.0	85	10.0	.7			do	1,200	
12	do	do	2.2	660	2.5	.7			do	2,500	
12	From Sappington's to Chicot	do	2.2	195	7.5	.7			do	2,300	
12	do	do	2.0	980	2.0	.7			do	2,700	
12	do	do	2.0	490	25.0	.7			do	17,100	
12	do	Over levee	1.0	330	0.5	.7			do	100	
12	do	do	1.0	330	1.0	.7			do	200	
12	do	do	1.0	1,640	0.5	.7			do	600	
12	do	do	2.0	655	1.0	.7			do	900	
12	do	do	1.0	1,310	0.5	.7			do	500	
12	do	do	2.0	655	0.5	.7			do	500	
12	do	do	2.0	655	1.0	.7			do	900	
12	do	Crevasse	2.3	30	5.0	.7			do	200	
12	do	Over levee	2.3	490	1.0	.7			do	800	
12	do	do	2.0	330	0.3	.7			do	100	
12	From Chicot to Arkansas City	do	2.0	1,970	1.0	.7			do	2,800	
12	do	do	2.0	8,000	1.0	.7			do	11,200	
											40,900
12	do	do	2.0	10,000	1.0	.7			Outflow	—14,000	
13	Arkansas City	do	2.0	7,500	0.5	.7	—.05	—.80	do	—5,300	
13	From lower end of new levee to the Gordon place	do	2.0	20,000	1.0	.7			do	—28,000	
											—6,400
13	do	Two crevasses	2.0	60	4.0	.7			do	—300	
13	do	Over levee	1.0	655	0.3	.7			do	—100	
											—6,800
13	Two miles above Gaines's Landing	do	1.0	330	1.0	.7			Inflow	200	
13	do	do	2.0	1,640	0.5	.7			do	1,100	

Table of water escape of the flood of 1883, *&c.*—Continued.

Date.	Locality.	Outlet.	V	W	D	C	O	O′	A	Q	Q″
1883.											
Mar. 13	Just above Gaines's Landing	Crevasse	2.1	345	23.5	.7			Inflow	11,900	
13	do	Over levee	2.0	655	0.5	.7			do	500	
13	do	Crevasse	2.0	215	2.0	.7			do	600	
13	do	do	2.3	65	16.0	.7	—.06	—.46	do	1,700	
13	do	do	3.0	100	10.0	.7			do	2,100	
13	do	do	3.0	65	2.0	.7			do	300	
13	do	do	3.2	65	5.5	.7			do	800	
13	do	do	3.0	60	5.0	.7			do	600	
13	Gaines's Landing to Point Comfort	do	3.0	245	5.0	.7			do	2,600	
13	do	Seven crevasses	3.0	90	2.0	.7			do	400	
13	do	Crevasse	1.8	2,045	6.2	.7			do	16,000	
13	do	do	1.7	660	6.0	.7			do	4,700	
13	do	do	1.3	330	6.0	.7			do	1,800	
13	do	do	1.0	100	4.0	.7			do	300	
13	do	do	1.3	330	6.5	.7			do	2,000	
13	do	do	1.3	80	4.5	.7			do	300	
13	do	do	1.3	65	4.0	.7			do	200	
13	do	do	1.3	215	3.5	.7			do	700	
13	do	do	1.3	100	5.5				do	500	
13	do	do	2.0	90	5.0	.7			do	600	
13	do	do	1.3	295	5.0	.7			do	1,300	
13	do	do	1.3	330	5.0	.7			do	1,500	
13	do	do	1.3	395	5.0	.7			do	1,800	
13	do	do	1.3	1.0	6.0	.7			do	2,200	
13	do	do	1.7	2,600	5.4	.7			do	12,800	
13	do	do	1.7	820	7.0	.7			do	6,800	
13	do	do	2.0	855	4.0	.7			do	4,800	
13	do	do	2.5	200	5.0	.7			do	1,700	
13	do	Levee washed	3.0	130	1.0	.7			do	300	
13	Back Linwood Place	Over levee	2.0	525	0.3	.7			do	200	
13	do	do	2.0	655	0.5	.7			do	500	
											77,000
13	Llewellyn's	Crevasse	1.0	15	2.0	.7	00	—.58	Outflow		
14	Front Linwood Place	Over levee	2.0	4,000	1.0	.7			do	—5,600	
											71,400
14	Above Luna	Crevasse	1.5	5,300	5.5	.7	00	—.58	Inflow	30,600	
14	Whisky Chute	Levee caved	3.1	330	4.5	.7			do	3,200	
											105,200
14	do	Old	2.2	150	10.0	.8	00	—1.0	do	2,600	
14	Ashton	Crevasse	2.3	150	7.0	.8			do	1,900	
14	do	do	2.0	3,000	3.0	.65			do	11,700	
14	do	do	1.0	11,500	1.0	.65			do	7,500	
											128,900

14	Wilson's Point						00	—2.4			
15	Goodrich's	Crevasse	4.0	425	*12.0	.7			Inflow	14,300	
15	do	do	4.0	165	*11.5	.7			do	5,400	
16	do	do	4.1	990	*11.0	.7			do	31,300	
16	do	Between new and old levees	2.3	†800	6.0	.7	00	—2.5	do	7,700	
16	Goodrich's (check estimate)	Gap in line of new levee	2.0	†9,400	4.5	.7			do	59,200	187,600

* Depth in the rear of the locus of scour; approximately equal to one-third of the mean depth of the section in the line of the levee. †Effective width.

5.—YAZOO, TENSAS, AND ATCHAFALAYA BASINS, FLOOD OF 1884.

(By John Ewens, United States Assistant Engineer.)

UNITED STATES STEAMER PATROL,
August 9, 1884.

SIR: I have the honor to submit herewith my report of the investigation of the flood escape into the Yazoo and Tensas Basins during high water of 1884; also, discharge measurements made on the Mississippi River at various points, on the Saint Francis and Yazoo Rivers, and in Bayou La Fourche, together with tables showing maximum stages of the river at various points, and also miscellaneous crevasse measurements made from Memphis to New Orleans. All done in accordance with your instructions of February 28, 1884.

Very respectfully, your obedient servant,
JOHN EWENS,
United States Gauge Inspector.

First Lieut. SMITH S. LEACH,
Corps of Engineers, U. S. Army,
Secretary Mississippi River Commission.

REPORT.

I received instructions by express at Memphis, Tenn., on the evening of February 27, 1883. Preparations were immediately made, and party left the morning of the 28th, at 10 o'clock. An earlier start would have been made were it not for the freezing cold and stormy condition of the weather. My instructions were to determine the water escape into the Yazoo Basin from Horn Lake to Helena, and to pay no attention to the Saint Francis side. I was to visit all crevasses, new or old, in the Yazoo Front as far as Cypress Creek; to ascertain the amount of water going through the levee from Amos Ridge down to the Mississippi below Sunflower, on the Yazoo side. Reported crevasses only were to be visited. The flow into Tensas from Cypress Creek to Ashton was to be determined; below Ashton, on the Tensas side, reported crevasses only were to be visited in addition to the above. The discharge of the Mississippi was to be measured at Hays' Landing, Mississippi. The discharge of the Saint Francis and the Yazoo Rivers was also to be taken. On arriving at Vicksburg, after completing the work noted above, instructions were received from you by telegraph to continue the crevasse discharge measurements and flood work down to New Orleans, which was done.

Party.—The work was accomplished by my regular engineering party, which is composed solely of the regular crew of the United States steamer Patrol. The steamer was used in every case where practicable, but, on account of the levees being situated back from the river front, skiffs had to be employed nearly exclusively.

In general, where skiffs can be used on river work they are far superior to any other conveyance for rapid work, which, in turn, means economy not only of time but fuel as well.

Method.—As has been stated above, the general location of the levees made it necessary to do the work with skiffs the great part of the distance traversed. As the outlets were principally through the levees, I found it necessary to follow them incessantly in order to secure complete measurements of the flood-escape through them. In many cases I found the levee over 6 miles back from the river bank. This was the case particularly in bends where, for economy in building, they were run across the necks or peninsulas at these points. The plan of working was as follows: The work of each day was so arranged that the steamer could be sent ahead to some landing that the field party in all probability would make the same night; this arrangement reduced the fuel expense about half, and retarded the wear of the machinery to a considerable extent. The work on each outlet consisted of a preliminary examination, which included the nature of the outlet, its cause, its present and probable future effect. The discharge in number of cubic feet of water passing through the break was then determined. The details of this work were as follows:

1. The section width of the outlet was determined. In cases where the section width was quite great, the measurements were made with a stadia rod. In cases where the section was, say, between 50 and 125 feet, the measurements were made with the sounding line, which was a very quick yet accurate way of securing it.

2. A transverse section across the outlet was next sounded. These soundings were taken with a three-eighths inch cotton line graduated to feet, and having a 15-pound lead attached. In taking the soundings the boat was kept on a line between the ends of the levee, or points limiting the cross-section. Where the current was too swift to

hold up against it the soundings were taken by running up above the section and then drifting back over the section. A sufficient number of soundings were taken to give a quite well defined contour of the bed of the outlet.

3. The surface velocity was then taken at as many points of the section as possible. As it was impossible to employ floats, a device known as ship's log was used in taking the velocity observations. This device is made of wood, and consists of a quarter segment of a circle having a diameter of about 12 inches, and a surface thickness of 1 inch. The curved edge of this segment is covered with a thin sheet of lead sufficient to give it a vertical position when in the water. This log is attached to a fine seagrass line by three fine wires. Two of the wires are detachable. This connection at the apex is made permanent, so as to draw in the log when the observation is completed. The two detachable strings that connect the log with the reel line terminate in two corks, which fit into two holes in the extremities of the curved and weighted part of the log. When the observation is complete, a slight twitch of the line pulls out these corks; the log by this means is easily drawn in, as it is in this condition nothing more than a small piece of thin board floating on the water surface. The grass line to which the log is attached is rolled in on an ordinary fishing reel, that has a small brake or clutch attachment for arresting the progress of the line at any desired point. The line is graduated into feet; every tenth foot is marked by pieces of line of color different from that of the line, and from each other. A stop-watch measuring one-fifth of a second was used in taking the time. The point of section where the velocity was to be determined having been selected, the skiff was held, either by anchoring or by holding upon the oars; the log was then launched and allowed a preliminary run of several feet, until it adjusted itself to the natural flow of the water; when time was called, the stop-watch was started, and the foot-mark or fractional division of the line that left the reel at same instant noted. When the line had nearly reached its limit on the reel, time was called again, the reel brake applied, and the watch stopped. These two quantities being determined, the surface velocity was deduced from them. In taking these observations care was taken to avoid the influence of eddies and boils, and a reach of the surface over which the velocity was visibly uniform was always sought after and used where possible. In addition to the above, the following points which are salient in crevasse investigation were determined:

1. Was the flow through a regular break or over the levee?

2. Was the flow free, or was it retarded by obstructions before reaching the section; were these obstructions in the bed of the section; was the bed of the section a natural one, or was it covered with a growth of young trees or underbrush?

3. Was the direction of the flow natural to, or at an angle with, section line?

4. Were there eddies or boils on a section line between center lines of the two ends of the levee, or limiting ends of the crevasse section? The presence or absence of these would indicate whether there were deep holes excavated below the bed proper of the section.

The necessity of strict attention to all these details must be obvious to any one familiar with crevasse work, and who knows how uncertain the most refined field measurements may be from a hydraulic standpoint when formulated. The section of a certain stratum for velocity as described above may, to persons inexperienced in work of this character, seem unnecessary. Now, the uniform stratum of water referred to, and over which the velocity should be taken, is generally a middle section, whose length is about one-third the distance from the mouth of the outlet, out to where the crevasse influence is exerted on the river or body of water from which the water flows. I mean, that if this distance was 300 feet, the stratum would be 100 feet in length, and its commencement would be 100 feet from the mouth of the crevasse. In the Davis crevasse the influence of the draught of this break was manifest about 100 feet out into the river; the distance out at which the influence is felt varies with level of the land behind the crevasse, and the width of the crevasse itself. The lower the latter the greater will be the distance at which the draw affects the body of water which feeds the break.

Before closing the discussion on the velocity, it will be well here to say a word regarding the velocities at the upper and lower side of a crevasse section. In most instances this was found to be greater on the upstream end of the crevasse than on the lower side. A skiff could always be more easily *cordelled* or rowed up near the lower edge of the break, than on the upper side, which fact, to a certain extent, practically proves the assertion. I attribute this to the fact, that the water that flanks the river bank in the upper side of the crevasse has the effect of the draw of a much larger mass of moving water than the volume that flanks the lower side, *i. e.*, the mass of moving water that enters the break has a greater moving force. The result of this is the acceleration of the mass of water on the upper side. On the lower side the water that enters the break is affected by the volume that endeavors to continue down the main river; the resultant of these two forces causes the retardation referred to above, and in consequence of which we find a diminution of velocity at the lower end of the break. All the points hinted at above were carefully looked after in the work

of which this report treats; and although work of this character will always have a tinge of unreliability about it, yet when the details are zealously attended to in the field, and carefully followed in every particular, the supposed non-tangible qualities will become more tangible.

Calculation.—In calculating the discharge, the usual conventional method used in computing the discharge through a regular river section admitted of considerable modification. This was necessary, as the conditions are (practically) in every particular different. The ratio between the maximum surface velocity and the true mean velocity has as yet been but arbitrarily determined. Water, in passing through a crevasse, admits of every degree of change of velocity imaginable, and approximates to that of the velocity when flowing through a natural bed, only as the bed of the crevasse approximates to a natural bottom. Where deep holes are excavated in the heart of the break, the eddies and boils these holes generate upwards have, without doubt, a retarding effect on the velocity. We know from hydraulic experiments made at Lowell and other points, that water, when discharged through pipes of varying section, loses a large percentage of its velocity. The flow of water through a crevasse of constantly varying section can be reasonably compared to a semi-section of such a pipe, and the retardation can reasonably be assumed to be one-half also, *i. e.*, in that ratio. From this I have concluded that the coefficient used in the computation of work of this character in the past has been too small. I think a coefficient of 0.86 will, from the knowledge attainable at present on the subject, be approximately correct, or at least reasonably so.

In using the coefficient no distinction was made for cases where the discharge was over the bank, *i. e.*, if the section was taken near the edge, as in such cases the conditions would be analogous to the one discussed above; as the stratum of water beneath the bank surface in impinging against the banks produces retarding elements in the shape of vertical eddies and boils, just the same as when the flow is through a regular crevasse; this was visibly the case at all points of this character I examined.

The cross section, like the velocity, is, in the case of a crevasse, a very uncertain, if not altogether a variable quantity. In my work I endeavored to eliminate errors in sectional area, by taking sections that would approximate to a regular river section as closely as possible. In crevasses where deep holes were scoured out between the ends of the levee, and below the normal bed surface, I generally took a section immediately above or below the limiting ends of the outlet. In a majority of cases the levees are situated a number of miles back from the river, and run through dense woods. In these cases the sectional area is diminished to a very appreciable extent by obstructions of brush, young trees, &c. The co-efficient to be used in reducing the observed to the effective area must be a very variable quantity, and one that must be determined wholly by actual observation at the time the soundings are taken and section width determined.

The coefficient used in the computation of areas for this work varied from 10 to 60 per cent. A very close estimate was arrived at by simply noting the diameter of the brush and other obstructing material, and its density as a whole.

Tabulation.—In the tabulation found on the succeeding pages the arrangements were made so as to make them simple for immediate comparison. The tables contain—

1. Place or vicinity of break.
2. Date of examination.
3. Date on which outlet was opened.
4. Nature of outlet.
5. Direction of escape.
6. Stage of water with reference to its maximum.
7. Width of outlet in feet.
8. Area of outlet in square feet.
9. Reduced mean velocity in feet per second.
10. Discharge in cubic feet per second.
11. General remarks.

The summation of results is arranged as follows:

1. Name of swamp basin.
2. Reach of outlet.
3. Distance in miles.
4. Total section width.
5. Total section area.
6. Total discharge.

Following this is a table of high-water stage at the principal points on the Mississippi River during the three last great floods. I give these, as they will be of great interest in connection with other data contained in this report.

The last tabulation is one of discharges taken on the Mississippi at various points, and on the Saint Francis and Yazoo rivers, and on Bayou La Fourche.

Summary of work and travel.

Left—	Date.	Time.	Arrived—	Date.	Time.	Distance.
						Miles.
Memphis, Tenn.....	Feb. 28	10 a. m.	Vicksburg, Miss.....	Mar. 18	1. 25 p. m.	369. 3
Vicksburg, Miss.....	Mar. 19	2. 30 p. m.	Davis Crevasse.....	Mar. 27	8 a. m.	353

Crevasses examined.—On Yazoo Front, 116; on Tensas Front, 48.

Discharges taken.—Mississippi River, at Hays' Landing, Miss.; Mississippi River, at Red River Landing, Louisiana; Mississippi River, at Carrollton, La; Saint Francis River, at Westbrook, Ark.; Yazoo River, near Chickasaw Bayou; Bayou La Fourche, near Thibodeaux, La.

Description of the flood on the Yazoo Front.—The Yazoo Front proper is situated on the left bank of the Mississippi River, and extends from Memphis, Tenn., to Vicksburg, Miss. The portion examined in particular was that included between Horn Lake and Glendale, Miss. The discharge over this front into the Yazoo swamp was principally through breaks in the levee. The first crevasse found was on Horn Lake. From the latter point to Star Landing the water was over the bank at various points, but there was no perceptible discharge into the swamp. About half a mile above Star Landing there were two depressions in the ground through which the river was discharging an inappreciable volume of water into the swamp. Below this landing I found an old slough bottom which heretofore has been shut off from the river by a levee, which, though flooded, was currentless. From Star Landing to a point about one mile below Mhoon's, Miss., I found a series of nearly 70 regular outlets formed by breaks in the levee, and through which the river was discharging large volumes of water into the swamp. The width of these breaks varied from 5 to 3,000 feet; the largest one was at Mhoon's Landing. The dense timber land that intervenes between the river and Mhoon's reduces greatly the discharge the river would make into the basin in this reach. The outlets on the reach just described were, in a majority of cases, caused first by the water running over the levee at points of low grade, this continued washing finally causing a large crevasse. In general, the crevasses on this reach can be considered due wholly to the negligence of the parties whom the levees protect, as the breaks could never have occurred by the simple pressure of the water against the levee. The points of low grade referred to above are places where the traffic across the levee has been concentrated. In many places great holes were caused by hauling logs across the levee.

From the crevasse one mile below Mhoon's to a point 2½ miles above Austin, the direction of the flow is reversed; the water from the swamp was found to be returning to the river. The discharge, in a majority of cases, was by the water running over the top of the levee. About twelve regular breaks were found on this reach, the largest of which was McKinney Bayou, situated about two miles above the town of Austin. This bayou was leveed, but broke in 1882. Its width at date of examination was 321 feet; the maximum depth of water found in it was 27 feet. Before it broke, the levee had a culvert in it for carrying the swamp water back into the river. About 4 miles below Mhoon's, the levee described above connects with a high ridge of ground which attains its maximum elevation on the widow Saunders's place. This ridge forms a levee for about 2 miles, when (the ground becoming low) it connects again with the levee. From McKinney Bayou down, the direction of the flow changes again, the river discharging into the swamp. From Austin to O. K. Landing five outlets were found, the largest of which were the first one below the court-house at Austin, and the one at Denmark. From O. K. Landing down to the junction of Flower Lake and Neill's Bayou, sixteen crevasses were found; the largest of these outlets were found on the shore of Flower Lake. The largest one of the whole series was at the end of the lake; its width was 853 feet, its maximum depth 55.5 feet. The discharge through the breaks in Flower lake was very great, a fact I think due to the great reservoir pressure the lake exerts against the levee. From the lower end of Flower Lake to Trotter's, nine outlets were examined, the largest of which was the immense break at Trotter's, where the levee has caved into the river. From Trotter's to Glendale, opposite Helena, the point which limits the special examination of the Yazoo Front, the crevasses found were located along Eagle Lake, the largest being at Ferguson's gin-house. The water was also running over the levee at many places. From Glendale to Friar's Point the crevasses, though smaller in number, are very large and more destructive. The first crevasses met with after leaving Glendale, are the two on the Thompson place; then come the three Rozeil breaks near Delta, and then the Fant break. From Friar's Point to Hulberton a series of seventeen outlets were visited, twelve of which were what is known as the Garth break, and five of which compose what is termed the McLeod break. The lat-

ter breaks are near the head of Island No. 63. From Hulberton to Sunflower Landing the only outlet is what is termed the "Lewis Swamp." The river boundary of this swamp begins at Hushpuckana Creek and extends up the river a distance of over 5 miles. No perceptible discharge could be detected in this front. The flow was outward from Hushpuckana Creek on date of examination, March 10. From Sunflower to Prentiss the Hughes break in Vermilion Lake was the only one found. This break occurred early on the morning of February 29; it was caused, it is said, by a crawfish hole. The crevasse was 768 feet wide; the water discharged through it passes down Clear Creek, and from thence into Bogue Phalia, the latter a very deep stream. From Prentiss to Vicksburg no crevasses were reported. There are, however, several small outlets from Chotard's to the mouth of the Yazoo, but nothing serious. From Hays' Landing to the mouth of the Yazoo River, what escape exists, flows from the river into the Yazoo Basin. During the great flood of 1882, the flow over this portion of the Yazoo front was reversed, the swamp water returning to the river.

Description of the flood on the right bank, from Helena to the mouth of Cypress Creek.—On the reach from Helena to Cypress Creek no discharge into the swamp was found. On the contrary, the swamp water was coming into the river at many points from Modoc, Arkansas, down to Cypress Creek; the flow is greatest on the reach from Ludlow's down. This swamp discharge comes principally from the White River Basin, which runs parallel to, and only a short distance from the Mississippi River along the reach referred to. It seemed to be more marked in the vicinity of Island No. 66, than at any other place.

Flood on the Tensas Front, general description.—The portion of this front that is bounded by the Mississippi River, is situated on the right bank, and begins properly at the point where Amos Ridge joins the great Opossum Fork levee, and extends down to the right bank of Shreve's Old River, just above Red River Landing. Amos Ridge is a high neck of land that borders the lower side of Amos Bayou. The point where it intersects the Opossum Fork levee, which point limits the overflow into Tensas Basin, is situated about 6 miles from the Mississippi River, and is about 3 miles from the point where Cypress Creek, Red Fork Bayou, and Boggy Bayou all come together. Cypress Creek, after leaving the Mississippi River, runs in a direction nearly parallel to it for a distance of nearly 5 miles; it then turns rather abruptly and runs nearly at right angles for a distance of about one-half mile, when it changes its course rather sharply again, and runs with and nearly parallel to Red Fork Bayou. The latter empties into Cypress Creek at the first of the sharp turns referred to. At the point where Cypress Creek makes the second sharp turn and runs nearly parallel to Red Fork Bayou, Boggy Bayou begins, and runs south until it joins Amos Bayou. The flood water that feeds the breaks along this levee comes principally from the Arkansas River. The stage of water in this district reached its maximum before the Mississippi had attained its extreme height. The water, after passing through the breaks in the levee from Amos Ridge down to the Mississippi, flows over the Tensas swamp lands. A large portion gets into the Tensas Basin direct through Bayou Maçon and other contiguous outlets, while a considerable volume reaches the Mississippi again via Boggy Bayou, near Island No. 80. From Arkansas City up to the Opossum Fork levee on Cypress Creek, the levee is nothing more than the old bed of the Little Rock, Mississippi River and Texas Railroad.

From Amos Ridge to the mouth of Cypress Creek this escape is principally through the large breaks in the levee. From the mouth of Cypress Creek to Arkansas City the escape is principally over the top of the levee, there being but few breaks of any magnitude. From Amos Ridge to a point about one mile below Chicot City, the discharge was into the swamp. From the latter point to Boggy Bayou, just below Arkansas City, the direction of the flow was reversed by the swamp water returning to the Mississippi River. From Boggy Bayou to Sterling the direction of the escape again changes; over this reach the river was discharging into the swamps. From Sterling to Ashton the change of flow occurs again, the swamp water returning to the river through about twelve large breaks in the levee, the largest of which is just below Gray's store. From Ashton to the mouth of Old River five outlets were found. These were at Hardscrabble, Bougére to Union Point, Black Hawk to Point Breeze, Point Breeze to mouth of Old River. The escape through all these outlets was over the bank proper, the levees having caved into the river. The water discharged through the Hardscrabble break passes directly into Lake Saint Joseph, and from thence by numerous lakes and bayous into the Tensas Basin. The water discharged through the remaining breaks, down to a point about one mile above Point Breeze, passes into Red River basin. From the latter point to Red River Landing, the direction of the discharge is changed. The swamp, or Red River water, over this reach was found emptying into the Mississippi. The discharge was outward from Old River on date of examination (March 21, 1884). I was informed that the change of flow in Old River and across the peninsula referred to took place on March 12, 1884. Previous to that date the Mississippi was discharging into the swamp over the reach referred to, and through Old River also.

DESCRIPTION OF FLOOD ON RIGHT BANK FROM RED RIVER LANDING TO NEW ORLEANS.

The first crevasse below Red River Landing was the one on the Batchelor place; this break was a very small one and did little or no damage. The next was the Morganza, discharging directly into Grand River, and from thence into the Atchafalaya swamp. It floods a portion of Point Coupee, Iberville, West Baton Rouge, and Saint Landry Parishes. This break occurred on the evening of March 14. The first intimation the levee watchers had of the break was the sudden appearance of a stream of water spouting up from one of the borrow pits on the inside and about seventy feet from the base of the levee. This stream of water kept growing larger until it reached the base of the levee, when all at once the levee proper at this point gave way. The break occurred at a point where it was least expected, and at what was supposed to be the safest part of the levee. The levee, before the break occurred, was a picture of strength; it was perfectly dry and stood from five to six feet above the water surface. The cause assigned for the crevasse was a deep bed of quicksand that existed below the muck ditch, and which connected with the bed of the river. This crevasse raised the flood surface in Bayou Plaquemine materially. The next crevasse met with was at Waterloo, seven miles below Bayou Sara, and occurred on the evening of March 23. The main levee at this point is some distance back from the river, but there is a protection levee on the river front. The latter gave way and precipitated a volume of water against the levee proper sufficient to break it. The levee on the river front served as a dike commanding the upper mouth of False River, was built in 1850, was 25 feet high, and had a very broad base. The breaks were due to an imperfectly constructed rice flume in the levee. This break is very apt to cause breaks in the protection levee at Grosse Tête, and thus overflow that valuable country. The water discharged through this crevasse takes the same course as the water discharged through the Scott levee took in 1882; it will affect the river front and all the places on the Chenille. The succeeding outlet was found on the Bel Air sugar plantation, 5 miles above Baton Rouge. This crevasse occurred on the morning of March 18. The cause of this break was attributed to a crawfish hole in the levee. All the fine sugar places in the immediate vicinity were under water from this break. This crevasse affects about the same parishes that Morganza does.

The next crevasses examined were those on the Guidry place, nearly opposite Convent, La. These breaks happened on the night of March 25, and were caused by the bursting of a rice flume built in the levee. The last crevasse on this bank of the river was the great Davis crevasse, situated at the railroad station of same name, in the Parish of Saint Charles, and about 21 miles from New Orleans. It occurred on March 15, and was caused by the levee giving away at a point where an old rice flume had been removed a few months previous to the high water. When the flume was taken out, the place left was filled in with fresh dirt, and not protected. The residents in the vicinity attribute the break to a muskrat hole. These animals were very numerous in the vicinity, and it is a well-known fact that they seek haunts formed of earth that has been displaced and transported from one place to another. The water discharged through this crevasse passes directly into numerous lakes and small bayous, and from thence to the Gulf. This crevasse floods completely the parishes of Saint Charles and Jefferson. It floods also the Vacherie settlement in Saint James Parish, and it backs the water up to a dangerous height in the rear of Algiers. It also backs up the crevasse water that comes through breaks on the La Fourche, and thus raises the flood height of water inside of the levee on the La Fourche.

Levees.—The location and course of the levee system along the river has been so fully described in previous reports of surveys, &c., that a description of them in this regard is unnecessary here. But a brief description of their condition at prominent points, with a few facts regarding their failure at many places during the high water of this year, will, I think, be of interest if not of importance here. With the exception of a few points where the levee was close to the bank and had caved off, I found the most disastrous crevasses were situated at considerable distances back from the river, and had dense woods intervening between them and the Mississippi, which protect them from the wash of the waves and materially from water pressure against their fronts. They had also a dense growth of Bermuda sod on them, in front and back of them. It will be seen from this that where the most crevasses were there was a larger number of safety factors. If levees failed with these natural protective adjuncts, it would be useless to build them. The cause of the breaks can be attributed simply to the abandonment and neglect of the levees by those whom they protect.

Beginning at Commerce, we find a levee protected nearly to Mhoon's by a dense woods on the river front. The breaks in this levee were all artifical ones, *i. e.*, they occurred at points where the levee had been worn by hauling logs, &c., across it, and by depredations of stock. As the river rose, incipient breaks, that a shovelful of dirt applied at the proper time would have obliterated, developed with the rise of the water into formidable crevasses.

From Mhoon's to Austin we find a similar state of affairs; the levee, from a protective view, is similarly situated to the one just described, but was a much finer one. The escape was principally over the top. The ground over which the levee runs is very high; at one point there is a stretch on a ridge of nearly 2 miles, where the ground itself is nearly above high-water mark. On the reach just mentioned, which is about 6 miles long, 2 feet of earth thrown up loosely would have protected the country from overflow the greater part of the way.

From Austin down to Flower Lake, the levee is a beautiful one; at flood stage it is nearly 3 feet above the water the greater part of the way, and has a dense thicket intervening between it and the river. The breaks were very small, and could have been easily repaired. From Flower Lake to Glendale, with the exception of the break at Trotter's, where the levee has caved into the river, the levee was in quite good condition, the breaks were not serious, and the place where the water was running over the top was not very deep. Along Flower Lake the levee was an unusually fine one, and was about 4 feet above the high-water mark. It will be seen from this that the crevasses from Horn Lake to Helena, which is the principal part of the Yazoo front, were not due to the pressure or ravages of flood water, but solely to simple neglect in caring for the levees during the low-water season. I speak particularly of this reach, as it is so often brought up to confront arguments in favor of levees, and to persons who are not familiar with the ground itself, and who know not the facts as they are.

The large number of breaks in this reach would furnish material for a very formidable argument against the utility and possible efficiency of levees in keeping out the waters of great floods. On the Tensas Front, from the mouth of Cypress Creek down, we find a quite similar state of affairs. Taking the reach from the creek to Arkansas City, we find a levee which is nothing more than an old railroad bed, over which the river is pouring, but a shallow depth of water, which a few feet of dirt on top would easily keep out. From Arkansas City to Gaines Landing, we find the levee is situated back in the timber, and is as well protected from the river as the levees previously referred to, yet we find breaks numerous, and from causes similar to those just mentioned. The effect floods have on levees protected by intervening woods having been discussed, a few words regarding levees situated on the immediate river front, and subject to all the forces the winds and water can generate is necessary to complete the discussion. The breaks between the mouth of Red River and New Orleans for this offered the best field of comparison, as they are nearly all on the river front.

On this front reach we have a levee front of nearly 198.2 miles on both banks, which represent an aggregate of 396.4 miles. On this stretch we have six breaks that will not aggregate in length 3 miles. Three of these breaks were due wholly to defective rice flumes in the levees, two to the depredations of crawfish, and one, the Morganza, which was the only one that was not directly on the river, was said to have been caused by the action of a bed of quicksand beneath the base of the levee.

From this it will be seen that not one of the breaks on this vast stretch of river was caused by the action of the flood water direct, and all, with but one exception, were due simply to neglect before the flood, and lack of vigilance after the flood had arrived. People who have lived for years right at the Davis crevasse, which was the most disastrous one of the late flood, informed me that for several flood seasons, when the old rice flume was in the levee, they feared a break, but by watching it vigilantly they prevented it. Before the past flood arrived, the family who had been instrumental in preventing this crevasse during previous floods moved; the result was, the levee was not properly strengthened or guarded, and a disastrous crevasse was the fruit of this neglect. As a more conclusive proof that breaks or crevasses at flood stages of the river are due to lack of watchfulness and care, rather than to the ravages of the river itself, I could refer to the river front on the left bank from Baton Rouge down to New Orleans. This side of the river has been noted for its crevasses, among which was the great Bonnet Carré crevasse. The levees on this reach were looked after exclusively during the late high water by the Mississippi Valley Railroad Company, and although at times the situation at many points, especially at Bonnet Carré and the Angelina levee, looked critical, yet not a single crevasse occurred, simply because the levees were well protected and vigilantly watched. The experience of the past year has demonstrated, I think, very conclusively that rice flumes are the great crevasse makers, and that they should be abolished. That they are employed in such an advanced age as this is a mystery, as a siphon would be more efficient and perfectly safe. These facts, which are actual, show, I think, to an approximate extent at least, that levees can be built that will sustain the greatest flood the Mississippi has carried thus far. I think, in the past, too much weight has been given to the effect the pressure of water has against the sides of a levee, and the delusion produced by witnessing a break has done much to strengthen this belief. This pressure, I think, with the exception of the cases of concave bends, furnishes no material for argument whatever. In bends the levees are generally run across the necks, so this obstacle is to a certain extent removed, From the brief description just given of actual facts

observed during the three greatest floods the Mississippi Valley has ever experienced, I feel partially competent to give a few crude points regarding what should be done to make the levee system a continued success. First, as to the type of levee. The old levees, built along in 1858 and 1859, furnish the best example, and should be patterned after where new levees are built, or old ones repaired in the future. In building the levee, borrow pits and ditches should be confined to the land side of the levee; where they are in front they furnish holes for crawfish, and where there is any current along the side of the levee they give rise to eddies and boils, which scour out great holes on the levee front, and these propagate a break. Where new levees are built, or when old ones are repaired, this work should be done immediately after the river falls, so as to give the new embankment time to settle before the flood water reaches it.

Where practicable, the growing of young trees, or hedge brush, should be encouraged on the front and near the base of the levee. After a levee is built, its care should be the next and all-important subject, as on it depends its usefulness and complete success. In the first place, traffic of all kinds should be prohibited, and the stock law rigidly enforced, especially in levee districts. At flood time the levee should be constantly watched, especially at points where danger is apprehended.

The flood season is usually at a time when plantation hands are not engaged; and they are so numerous compared with the miles of levees to be guarded that it would be easy to have the levees under complete surveillance continually during a flood. A levee never breaks spontaneously; it is always known several hours beforehand where danger is imminent by such signs as sipage water, the settling of the crown, &c.; and, by having sacks, lumber, and other defensive material properly distributed, an incipient break could be prevented from developing into a formidable crevasse in nine cases out of ten. From the calculations it will be seen that the net river discharge into the Yazoo and Tensas basins is considerably greater than the discharge of the Mississippi at Red River Landing. I take this point because it has no tributary influence below, and has no natural outlet until it reaches the Gulf, except the La Fourche, whose discharge is so small that it has little or no weight. The escape from the river into the swamps between the mouth of Red River and Carrollton is more than half the actual flood discharge of the river at the latter point. The figures may at first seem startling, but when all the facts relative to them are considered wonderment will cease.

Before concluding, I can but say that I think a complete, efficient, and permanent levee system that will withstand the effects of the greatest flood the valley has ever been subjected to thus far is possible in every particular if the levees are properly built and protected, and properly guarded during the seasons of great floods. The latter factor is the principal one, and if carefully looked after will give the valley dry and fertile fields, and freedom from the distress and disaster which characterizes and always follows great floods.

Respectfully submitted.

JOHN EWENS,
United States Assistant Engineer.

First Lieut. SMITH S. LEACH,
Corps of Engineers, U. S. Army,
Secretary Mississippi River Commission.

AUGUST 9, 1884.

Escape of the water of the Mississippi River into the swamps during the flood of 1884.

[These outlets began 5 miles above Mhoon's. There were dense woods on both sides of these outlets, so that the log line could not be used in a large number of instances.]

YAZOO BASIN FROM HORN LAKE TO HELENA.

Place.	Date of examination.	Date of opening of outlet.	Nature of outlet.	Direction of escape.	River below flood stage.	Width of outlet.	Area of outlet.	Reduced mean velocity per second.	Discharge through outlet per second.
					Feet.	*Feet.*	*Sq. feet.*	*Feet.*	*Cubic feet.*
Horn Lake	Feb. 28, 1884	Mar. 5, 1882	Crevasse	In swamp	0.2	170	2,660	2.50	6,898
5 miles above Mhoon's	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	10	10	1.72	17
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	10	10	1.72	17
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	5	5	1.72	17
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	125	1,340	2.66	3,572
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	35	77	2.58	198
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	100	260	1.97	514
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	110	260	2.58	670
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	260	1,120	2.58	2,889
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	6	12	2.58	30
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	200	660	2.58	1,702
Do	Feb 29, 1884	Mar. 5, 1882	do	do	1.2	350	1,330	2.58	3,431
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	25	75	2.58	193
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	15	30	2.58	51
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	25	50	2.58	129
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	35	87	2.58	225
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	18	36	2.58	92
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	36	108	2.58	278
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	60	180	2.58	464
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	50	150	2.58	387
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	10	30	1.72	51
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	15	30	2.58	77
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	50	100	3.44	344
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	560	1,760	2.58	5,056
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	50	150	2.58	282
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	100	550	2.15	1,182
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	50	200	1.72	344
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	110	385	2.58	993
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	15	45	1.72	77
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	75	225	2.58	580
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	250	925	2.58	2,386
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	800	3,200	2.15	6,880
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	200	1,140	2.58	2,841
Do	Feb. 29, 1884	Mar. 5, 1882	do	do	1.2	76	360	2.58	928
Do	Feb. 29, 1884	Feb. 29, 1882	Over levee	do	*1.2	3,000	4,500	1.72	7,720
At Mhoon's Landing	Mar. 1, 1884	Feb. 12, 1882	Crevasse	do	1.2	702	3,180	2.23	7,110

Do	Mar. 1, 1884	Feb. 12, 1882	....do	....do	1.2	47	112	3.01	339
Do	Mar. 1, 1884	Feb. 12, 1882	....do	....do	1.2	2,800	16,760	1.11	18,737
1 mile below Mhoon's	Mar. 1, 1884	Feb. 16, 1882	....do	Into river	1.2	200	600	2.15	1,290
Do	Mar. 1, 1884	Feb. 16, 1882	....do	....do	1.2	1,500	4,500	2.58	11,610
Do	Mar. 1, 1884	Feb. 16, 1882	....do	....do	1.2	1,500	4,500	2.58	11,610
Do	Mar. 1, 1884	Feb. 16, 1882	....do	....do	1.2	850	5,660	1.89	10,708
Do	Mar. 1, 1884	Feb. 16, 1882	....do	....do	1.1	20	124	2.15	258
Do	Mar. 1, 1884	Feb. 16, 1882	....do	....do	1.2	40	80	2.15	172
Do	Mar. 1, 1884	Feb. 16, 1882	....do	....do	1.2	15	60	3.44	206
Do	Mar. 1, 1884	Feb. 16, 1882	....do	....do	1.2	6	12	1.72	20
Do	Mar. 1, 1884	Feb. 16, 1882	....do	....do	1.2	18	45	3.44	154
Do	Mar. 1, 1884	Feb. 16, 1882	....do	....do	1.2	14	28	1.72	48
Do	Mar. 1, 1884	Feb. 16, 1882	....do	....do	1.2	1,500 500	6,040 900	3.01 3.01	18,180 2,709
Do	Mar. 1, 1884	Feb. 16, 1882	Over levee	....do	0.65	1,800	1,800	3.44	5,192
Do	Mar. 1, 1884	Feb. 16, 1882	....do	....do	0.65	125	125	3.44	430
Do	Mar. 1, 1884	Feb. 16, 1882	....do	....do	0.65	150	225	3.44	774
McKinney Bayou	Mar. 2, 1884	Feb. 16, 1882	Crevasse	....do	0.25	341	4,340	1.97	8,584
Do	Mar. 2, 1884	.....	Over levee	In swamp	† 0.65	11,560	23,120	2.15	49,708
At Austin	Mar. 3, 1884	Mar. 5, 1882	Crevasse	....do	0.15	10,560 452	10,560 4,620	3.44 2.15	36,726 9,933
Below Austin	Mar. 3, 1884	Mar. 5, 1882	....do	....do	0.15	40	240	2.58	619
Do	Mar. 3, 1884	Mar. 5, 1882	....do	....do	0.15	144	520	3.61	1,878
Do	Mar. 3, 1884	Mar. 5, 1882	....do	....do	0.15	75	330	2.58	851
Do	Mar. 3, 1884	Mar. 5, 1882	Over levee	....do	0.15	600	1,500	2.15	3,225
Denmark	Mar. 3, 1884	Mar. 5, 1882	Crevasse	....do	0.15	196	4,840	2.92	14,152
O. K. Landing	Mar. 3, 1884	Mar. 5, 1882	....do	....do	0.15	‡ 250	37	2.15	80
Do	Mar. 3, 1884	Mar. 5, 1882	....do	....do	0.15	196	940	3.01	2,829
Do	Mar. 3, 1884	Mar. 5, 1882	....do	....do	0.15	30	135	3.01	406
Do	Mar. 3, 1884	Mar. 5, 1882	....do	....do	0.15	38	171	3.01	514
Jones' store	Mar. 3, 1884	Mar. 5, 1882	....do	River from swamp	0.15	100	640	0.43	275
Do	Mar. 3, 1884	Mar. 5, 1882	....do	In swamp	0.15	40	40	0.86	34
Do	Mar. 3, 1884	Mar. 5, 1882	....do	....do	0.15	30	45	0.86	38
Do	Mar. 3, 1884	Mar. 5, 1882	....do	....do	0.15	78	452	3.01	1,361
Do	Mar. 3, 1884	Mar. 5, 1882	....do	....do	0.15	60	90	2.58	232
Do	Mar. 3, 1884	Mar. 5, 1882	....do	....do	0.15	20	30	2.58	77
Do	Mar. 3, 1884	Mar. 5, 1882	....do	....do	0.15	100	200	2.15	430
Do	Mar. 3, 1884	Mar. 5, 1882	....do	....do	0.15	25	50	2.15	107
Flower Lake	Mar. 3, 1884	Mar. 5, 1882	....do	....do	0.15	60	162	4.30	696
Do	Mar. 3, 1884	Mar. 5, 1882	....do	....do	0.15	853	33,000	1.89	62,436
Do	Mar. 3, 1884	Mar. 5, 1882	....do	....do	0.15	420	2,840	4.04	11,479
Do	Mar. 6, 1884	Mar. 5, 1882	....do	....do	0.0	105	980	3.69	3,624
Do	Mar. 6, 1884	Mar. 5, 1882	....do	....do	0.15	10	10	1.29	12
Do	Mar. 6, 1884	Mar. 5, 1882	Over levee	....do	0.15	800	3,240	2.58	8,359
Do	Mar. 6, 1884	Mar. 5, 1882	Crevasse	....do	0.15	600	1,020	2.58	2,631
Do	Mar. 6, 1884	Mar. 5, 1882	....do	....do	0.15	86	731	3.01	2,200
Do	Mar. 6, 1884	Mar. 5, 1882	....do	....do	0.15	216	1,520	1.72	2,614
Do	Mar. 6, 1884	Mar. 5, 1882	Over levee	....do	0.15	400	400	2.58	1,032
Trotter's Landing	Mar. 6, 1884	Mar. 5, 1882	Over bank	....do	0.15	265	11,200	2.06	23,116

* This is an aggregate of the whole reach *i. e.*, where it is simply running over the levee. † Aggregate from McKinney's Bayou to Austin, where it is simply running over the levee. ‡ Levee back from the landing, in the woods.

Escape of the water of the Mississippi River into the swamps during the flood of 1884—Continued.

YAZOO BASIN FROM HORN LAKE TO HELENA—Continued.

Place.	Date of examination.	Date of opening of outlet.	Nature of outlet.	Direction of escape.	River below flood stage.	Width of outlet.	Area of outlet.	Reduced mean velocity per second.	Discharge through outlet per second.
					Feet.	*Feet.*	*Sq. feet.*	*Feet.*	*Cubic feet.*
On Eagle Lake	Mar. 8, 1884	Mar. 5, 1882	Crevasse	In swamp	0.25	300	150	1.29	193
Do	Mar. 8, 1884	Mar. 5, 1882	do	do	0.25	200	100	1.29	129
Do	Mar. 8, 1884	Feb., 1882	do	do	0.25	200	800	1.72	1,376
Ferguson's Gin	Mar. 8, 1884	Feb., 1882	do	do	0.25	262	1,980	2.75	5,448
Glendale	Mar. 8, 1884	Feb., 1882	do	do	0.25	110	1,950	1.97	3,857
Do	Mar. 8, 1884	Feb., 1882	do	From shore into river	0.25	118	1,330	3.09	4,117

YAZOO BASIN FROM HELENA TO VICKSBURG.

Thompson's Point No. 1	Mar. 8, 1884	Feb., 1882	Crevasse	In swamp	0.25	§885	6,620	4.98	33,020
Thompson's Point No. 2	Mar. 8, 1884	Feb., 1882	do	do	0.25	248	5,740	4.55	26,162
Dillard and Coffin	Mar. 8, 1884	Feb., 1882	do	do	0.25	557	8,633	6.88	60,398
Gordon's	Mar. 8, 1884	Feb., 1882	do	do	0.25	498	4,986	6.88	34,309
Rozell No. 1	Mar. 9, 1884	Feb., 1882	do	do	0.45	406	3,720	3.26	12,156
Rozell No. 2	Mar. 9, 1884	Feb., 1882	do	do	0.45	183	1,200	1.03	1,238
Rozell No. 3	Mar. 9, 1884	Feb., 1882	do	do	0.45	623	5,220	2.59	13,556
Fant's	Mar. 9, 1884	Feb., 1882	do	do	0.45	446	3,920	4.30	16,856
Garth No. 1	Mar. 9, 1884	Feb., 1882	Overlevee	do	0.45	1,500	9,000	1.72	15,480
Garth No. 2	Mar. 9, 1884	Feb., 1882	Crevasse	do	0.45	200	2,700	5.16	13,932
Garth No. 3	Mar. 9, 1884	Feb., 1882	do	do	0.45	600	3,600	1.72	6,192
Garth No. 4	Mar. 9, 1884	Feb., 1882	do	do	0.45	100	510	3.44	1,754
Do	Mar. 9, 1884	Feb., 1882	do	do	0.45	35	175	3.44	602
Do	Mar. 9, 1884	Feb., 1882	do	do	0.45	250	1,460	3.01	4,394
Do	Mar. 9, 1884	Mar. 8, 1884	Overlevee	do	0.45	100	600	1.72	1,032
Do	Mar. 9, 1884	Mar. 8, 1884	do	do	0.45	200	1,200	1.72	2,064
Do	Mar. 9, 1884	Mar. 8, 1884	do	do	0.45	250	2,600	2.15	5,590
Do	Mar. 9, 1884	Mar. 8, 1884	do	do	0.45	125	760	3.44	2,614
Do	Mar. 9, 1884	Mar. 8, 1884	do	do	0.45	108	1,240	2.58	3,199
Do	Mar. 9, 1884	Mar. 8, 1884	do	do	0.45	10	10	0.86	8
McLeod's	Mar. 8, 1884	Flood 1882	Crevasse	do	0.45	200	1,740	1.29	2,244
Do	Mar. 8, 1884	do	do	do	0.45	250	2,360	1.72	4,059
Do	Mar. 8, 1884	do	do	do	0.45	904	4,280	3.44	14,723
Do	Mar. 8, 1884	do	do	do	0.45	505	1,620	2.58	4,179
Do	Mar. 10, 1884	do	do	do	0.2	393	2,420	3.52	8,532
Hughes*	Mar. 12, 1884	Feb. 29, 1884	do	do	0.1	767	9,880	4.64	45,882

TENSAS BASIN FROM CYPRESS CREEK TO RED RIVER LANDING.

Amos Ridge	Mar., 1884	In 1882	Over levee	In swamp	0.10	7,000	4,900	6.88	†33,712
Boggy Bayou	Mar., 1884	do	Natural Bayou	do	0.10	250	8,000	6.88	55,040
On Cypress Creek	Mar., 1884	do	Over levee	do	0.10	1,100	1,320	3.44	4,540
Do	Mar., 1884	do	Crevasse	do	0.10	2,200	4,400	6.88	30,272
Do	Mar., 1884	do	do	do	0.10	800	5,600	6.88	38,528
Do	Mar., 1884	do	do	do	1.10	600	4,200	6.88	28,896
Do	Mar., 1884	do	do	do	0.1	700	14,000	1.72	24,080
Lucca Landing	Mar. 12, 1884	do	do	do	0.1	150	150	1.29	193
Do	Mar. 12, 1884	do	Over levee	do	0.1	200	200	1.29	258
Do	Mar. 12, 1884	do	do	do	0.1	150	150	1.29	193
Chicord	Mar. 12, 1884	do	Crevasse	do	0.1	100	8,800	2.58	2,270
Do	Mar. 12, 1884	do,	Over levee	do	0.1	528	5,280	1.82	6,441
Do	Mar. 12, 1884	do	do	do	0.1	500	500	0.72	‡215
One mile below Charles City	Mar. 12, 1884	do	do	Into river	0.1	13,200	6,600	0.43	2,706
Arkansas City	Mar. 12, 1884	do	Crevasse	do	0.1	400	2,400	2.58	6,192
Do	Mar. 12, 1884	do	Regular Bayou	do	0.1	100	2,000	3.44	6,880
Do	Mar. 12, 1884	do	Over levee	In swamp	0.1	10,000	2,500	1.72	4,300
Boggy Bayou	Mar. 12, 1884	do	Crevasse	do	0.1	141	141	3.44	485
Do	Mar. 12, 1884	do	do	do	0.1	50	240	4.21	1,011
Do	Mar. 12, 1884	do	do	do	0.1	30	30	2.15	64
Gaines's Landing	Mar. 12, 1884	do	do	do	0.1	25	25	2.15	53
Do	Mar 12, 1884	do	do	do	0.1	183	2,780	2.35	9,324
Do	Mar. 12, 1884	do	do	do	0.1	50	75	2.58	183
Do	Mar. 12, 1884	do	do	do	0.1	100	150	2.58	387
Do	Mar. 12, 1884	do	do	do	0.1	100	200	2.58	516
Do	Mar. 12, 1884	do	do	do	0.1	25	75	3.44	258
Do	Mar. 12. 1884	do	do	do	0.1	108	980	2.15	2,107
Do	Mar. 12, 1884	do	do	do	0.1	75	562	2.58	1,451
Do	Mar. 12, 1884	do	do	do	0.1	50	25	1.72	43
Do	Mar. 12, 1884	do	do	do	0.1	100	200	1.72	344
Do	Mar. 12, 1884	do	do	do	9.1	100	2,600	2.58	670
Brooks's Saw-mill	Mar. 14, 1884	do	do	do	0.1	50	300	4.30	1,290
T. Cox's Point to Grand Lake	Mar. 14, 1884	do	Over bank	do	0.1	21,120	80,256	1.97	158,736
Grand Lake	Mar. 14, 1884	do	Crevasse	do	*0.49	75	75	1.29	96
Cracrost	Mar. 15, 1884	do	Over bank	do	0.49	4,000	8,000	0.86	6,880
Near and above Graves's store	Mar. 15, 1884	do	Crevasse	Into river	0.49	10	10	0.86	8
Below Graves's store	Mar. 15, 1884	do	do	do	0.49	10	20	1.29	25
Do	Mar. 15, 1884	do	do	do	0.49	25	60	1.72	163
Do	Mar. 15, 1884	do	do	do	0.49	110	2,790	3.01	8,397
Do	Mar. 15, 1884	do	do	do	0.49	35	105	1.72	180
Do	Mar. 15, 1884	do	do	do	0.49	50	225	2.15	483
Do	Mar. 15, 1884	do	do	do	0.49	60	168	3.44	577
Do	Mar. 15, 1884	do	do	do	0.49	25	100	3.01	301
Do	Mar. 15, 1884	do	do	do	0.49	60	240	3.44	825
Do	Mar. 15, 1884	do	do	do	0.49	30	105	3.44	361
Do	Mar. 15, 1884	do	do	do	0.49	35	112	3.01	338
Half mile above Woodfork	Mar. 15, 1884	do	do	do	0.49	50	175	2.58	451

*This break is on Vermillion Lake. †Information received from Colonel Coleman. ‡Aggregate.

Escape of the water of the Mississippi River into the swamps during the flood of 1884—Continued.

TENSAS BASIN FROM CYPRESS CREEK TO RED RIVER LANDING—Continued.

Place.	Date of examination.	Date of opening of outlet.	Nature of outlet.	Direction of escape.	River below flood stage.	Width of outlet.	Area of outlet.	Reduced mean velocity per second.	Discharge through outlet per second.
					Feet.	*Feet.*	*Sq. feet.*	*Feet.*	*Cubic feet.*
Half mile above Woodfork	Mar. 15, 1884	In 1882	Crevasse	Into river	0.49	2,000	3,000	1.72	5,160
Hardscrabble	Mar. 20, 1884	do	Over bank	In swamp	0.3	4,000	14,400	1.63	23,529
Bougere, La., to Union Point	Mar. 20, 1884	do	do	do	0.3	21,120	89,337	1.29	115,781
Black Hawk to Point Breeze	Mar. 21, 1884	do	do	do	0.3	26,400	126,720	0.86	*108,979
Point Breeze to mouth of Old River	Mar. 21, 1884	do	do	Into river	0.3	31,680	63,360	0.86	*54,489
Old River	Mar. 21, 1884	1831.	Natural outlet	do	0.3	923	31,891	2.60	†85,823

ATCHAFALAYA BASIN FROM RED RIVER LANDING TO NEW ORLEANS.

Batchelor's Place	Mar. 23, 1884	Mar. 23, 1884	Crevasse	Into river	0.3	40	240	1.72	‡412
Morganza's Crevasse	Mar. 25, 1884	Mar. 14, 1884	do	In swamp	0.3	1,902	31,880	6.62	211,109
Waterloo Crevasse	Mar. 25, 1884	Mar. 23, 1884	do	do	0.2	314	6,280	7.31	45,906
Belle Air Crevasse	Mar. 25, 1884	Mar. 18, 1884	do	do	0.2	255	1,620	8.60	13,932
Guidry's Crevasse No. 1	Mar. 26, 1884	Mar. 25, 1884	do	do	0.5	40	160	4.30	688
Guidry's Crevasse No. 2	Mar. 26, 1884	Mar. 25, 1884	do	do	0.5	150	525	5.16	2,709
Bayou La Fourche	Apr. 17, 1884	Mar. 25, 1884	Natural outlet	do	2.95	271	3,753	3.07	11,533
Davis Crevasse	Mar. 27, 1884	Mar. 15, 1884	do	do	0.5	557	11,640	12.9	§140,156

* Estimated. † Computed. ‡ Computed from a discharge taken January 16, 1882. § Depths estimated from shore end soundings.

Flood escape into the swamp basins during high water of 1884.

Basin.	Locality.	Distance.	Total sectional width.	Total sectional area.	Total discharge, cubic feet per second.
		Miles.	*Feet.*	*Sq. feet.*	
Yazoo	Horn Landing to Helena, outflow	62.1	42,100	154,030	340,231
Do	Horn Landing to Helena, return flow		8,797	30,999	76,341
Do	Horn Landing to Helena, net escape				263,890
Do	Helena to Vicksburg, outflow*	292.8	10,349	86,195	334,184
Total escape into Yazoo Basin					598,074
Tensas	Cypress Creek to Ashton, outflow	94.5	55,413	156,715	412,843
Do	Cypress Creek to Ashton, return flow		14,190	15,110	27,894
Do	Cypress Creek to Ashton, net escape				384,949
Do	Ashton to Railroad Landing, outflow	244.8	51,520	230,458	248,290
Do	Ashton to Railroad Landing, return flow		32,603	95,251	140,313
Do	Ashton to Railroad Landing, net escape				107,977
Total escape into Tensas Basin					492,926
Atchafalaya	Railroad Landing to New Orleans, outflow*	198.2	3,533	56,098	426,447

*No return flow.

Table giving maximum gauge heights and dates on which the river obtained flood stage at various points on the Mississippi River in 1882, 1883, *and* 1884.

Place.	Date.	Gauge height.	Date.	Gauge height.	Date.	Gauge height.
	1882.	*Feet.*	1883.	*Feet.*	1884.	*Feet.*
Saint Louis, Mo	July 5	32.20	June 26	34.80		
Rush Tower, Mo	July 5	37.50			April 11	34.70
Grand Eddy, Mo	July 6	39.10	June 27	41.92	Apr. 10–11	36.35
Gray's Point, Mo					April 11	28.17
Cairo, Ill	Feb. 26	51.87	Feb. 27	52.17	Feb. 22–24	51.79
Columbus, Ky	Feb. 26	102.79	Feb. 27	103.046	Feb. 23–24	103.80
New Madrid, Mo	Feb. 27	41.615	Feb. 28	42.020	Feb. 24	41.50
Cottonwood Point, Mo	Feb. 28	37.50	Feb. 28	37.85	Feb. 24–26	37.45
Fulton, Tenn	Mar. 1	36.69	Feb. 28	36.29	Feb. 25–29	35.68
Memphis, Tenn	Mar. 9	35.15	Mar. 6	34.75	March 1	34.15
Mhoon's, Miss	Mar. 9	39.80	Mar. 8	40.20	March 5–6	38.90
Helena, Ark	Mar. 9	47.20	Mar. 9	46.90	March 6	47.00
Saint Louis Landing, Ark	Mar. 9		Mar. 10	41.75	March 6–7	48.20
Mouth of White River	Feb. 28	48.40	Mar. 10	48.00	March 7–8	47.90
Arkansas City, Ark	Feb. 28	47.00	Mar. 10	46.32	March 7–9	46.50
Greenville, Miss	Feb. 27	41.68	Mar. 12	40.40	March 8	41.10
Lake Providence, La	Mar. 20	38.32	Mar. 12	36.47	Mar. 23–24	38.40
Vicksburg, Miss	Mar. 20	48.75	Apr. 7	43.80	March 25	49.00
Saint Joseph, La	Mar. 20	44.90	Apr. 7	41.90	March 24	44.89
Natchez, Miss	Mar. 28	47.75	Apr. 7	44.00	Mar. 24–26	47.46
Red River Landing, La	Mar. 27	48.50	Apr. 9	45.20	Mar. 29–31	47.30
Port Hickey, La	Mar. 28	47.90	Mar. 15	47.47	March 29	47.42
Baton Rouge, La	Mar. 21	35.95	Apr. 6	35.08	March 24	36.20
Plaquemine, La	Mar. 21	31.30	Apr. 9	30.73	March 30	31.60
College Point, La	Mar. 22	23.07	Apr. 9	23.40	March 24	24.00
Carrollton, La	Mar. 21	14.95	Apr. 9	15.40	March 18	15.65

Table of discharges taken by patrol party during the flood of 1884.

River.	Locality.	Date.	Gauge-reading.	Place.	Discharge in cubic feet per second.	Area in square feet.	Mean velocity in feet per second.
		1884.					
Saint Francis	Westbrook, Ark.....	Mar. 4	38.80	Mhoon's	135,651	26,254	5,167
Mississippi	Hays' Landing, Miss ..	Mar. 16	37.72	Hays'	1,066,758	171,253	6,229
Yazoo	Near Chick. Bayou	Mar. 18	46.50	Vicksburg.....	161,322	42,253	3,818
Mississippi	Red River Landing, La	Mar. 21	46.05	Red River Landing.	1,291,625	228,280	5,658
Bayou LaFourche	Near Thibodeaux, La..	Apr. 14	22.20	College Point ...	11,533	3,753	3,070
Mississippi	Carrollton, La	Apr. 15	14.15	Carrollton	892,362	197,317	4,522

NOTE.—Column headed "Place" refers to column headed "Gauge."

APPENDIX B.

PRECISE LEVELS—REPORTS AND RESULTS.

1.—*Final reduction and results of precise levels from Fulton to Chicago, Ill.*

OFFICE MISSISSIPPI RIVER COMMISSION,
Saint Louis, Mo., October 9, 1883.

SIR: I have the honor to submit the following report on the reduction of the notes of the precise leveling from Fulton, Ill., to Chicago.

The office computation has been made by Assistants Ferguson, Fitzhugh, Thomas, and Kastl. The methods of reduction employed are the same as those used in the reduction of the notes of the precise leveling from Carrollton, La., to Biloxi, Miss.

The following are the values of instrumental constants used:

Correction for inequality of pivots in millimeters, per meter:

Level No. 1 p = from — .015 to + .005.
Level No. 3 p = from — .006.
Level No. 5 p = from — .010.

Assistant J. B. Johnson used level tube No. 5 and level instrument No. 3 throughout the season, with the exception of having used the telescope barrel (not the reticule) of level instrument No. 5 from June 7 to end of season.

Value of one division of tube No. 3, v = 2″.44.
Value of one division of tube No. 5, v = 2″.54.

The mean value of 1 millimeter of the four rods used, Nos. 14, 15, 16, and 17, is 1.000029 millimeters, which value results from comparisons made August, 1882, with 1 millimeter bar, rods at a mean temperature of 73° F.

Assistant J. B. Johnson also made a determination of the lengths of the above rods in December, 1882, by comparison with the 15-foot bar of the Lake Survey Office. The rods were at a temperature of 54° F., and the mean value then found was 0.999950 millimeters, which differs from the comparisons used by 0.000079 millimeters. Part of this discrepancy, I think, is to be accounted for by the difference in temperature (19° F.) of the rods themselves. I believe there was no correction made for coefficient of expansion of the wood. Using the same as for white pine given by Trautwine, .0000022, the correction for temperature will be 0.000042 millimeters. Applying this the discrepancy between the August and December determinations is only 0.000037 millimeters. I believe there were also no observations taken for humidity of the atmosphere, which influences the change in length of wood more than change in temperature. The August observations were taken in basement, the December observations were taken in commissioner's room, on second floor. The maximum rod correction used was 3.1 millimeters.

The following were the distances from the foot of the rods to the 100 millimeter mark of graduation:

	Millimeters.
Rod 14	44.4
Rod 15	44.9
Rod 16	44.1
Rod 17	44.3

May 8, 1883, the rods were ground off to a uniform length of 44.2 millimeters. Up to May 8 corrections were made in this computation for the difference of length of rods whenever a stretch was not closed with the same rod as it was started with. After this date no correction was necessary.

The tabulation of the results of the final reduction is given on pages 24 to 40, inclusive. All elevations are referred to Cairo datum and start with the elevation of U. S. P. B. M. 53, near Albany, Ill. As 188.6009 millimeters (see Annual Report for 1883, page 128), on account of U. S. P. B. M 55, of the Keokuk and Fulton line, having been disturbed or at least meddled with, the field tabulation was started with elevation of U. S. P. B. M 56, next beyond (183.6809 millimeters), but the Keokuk to Fulton line was duplicated from U. S. P. B. M. 53 to U. S. P. B. M. 56. The former line of levels over this stretch was more concordant than the latter. At U. S. P. B. M., a distance of 5.9 kilometers, the lines diverged by 6.2 millimeters, our elevation of U. S. P. B. M. 56, as run from U. S. P. B. M. 53, in 1883, being 6.2 milimeters lower; however, as U. S. P. B. M. 53 was considered more permanent than U. S. P. B. M. 56, it was thought best in the office reduction to continue the Keokuk-Fulton elevations from U. S. P. B. M. 53. This was done However, it is questionable if the mean of the two lines from U. S. P. B. M. 53 to U. S. P. B. M. 56 would not be better.

In connecting Chicago benches with city directrix the levels were carried from shore to the zero of our temporary gauge on outside of crib by comparing the readings of this gauge successively with the readings of three temporary gauges on shore widely separate. These were combined with equal weight with a determination made by the city engineer in December, 1878, using Hook gauges, reading by Vernier to 0.001 foot. These were carried through the tunnel, all pumping (and therefore all current) having ceased. The elevations are carried from the zero of the outer gauge to city directrix, a point 8.01 feet below the zero of the inner crib gauge, by spirit-levels.

The work for the season is as follows:

	Kilometers.
Distance of main line duplicated	261.36
Side	13.43
	274.79

(All side line duplicated except 1.71 kilometer, which was only run one way.)

Length of repeated duplicate work:

	Kilometers.
3 lines	2.19
4 lines	28.28
5 lines	2.01
6 lines	0.73
8 lines	2.15
	35.36

Total length of single line, 628.49 kilometers.

The probable error of the whole line of levels from Fulton to Chicago on the terminal benches at Chicago is 13.6 millimeters. This is computed by considering all discrepancies as accidental, the square root of the sum of the squares then remaining uncompensated. There are, however, constant errors or accumulating errors, which is the algebraic sum of the personal errors of the members of the party concerned in carrying the levels. This constant error changes very materially on account of the following conditions: (1) Owing to the nature of the ground; (2) owing to the nature of the weather; and (3) owing to the changing habits of the members concerned. It is therefore next to impossible to obtain any approximate measure of it. We are quite safe to assume that it remains approximately constant for any and perhaps every one of our various stretches. And since the functions from which we compute the probable error of final result (R. = 13.6 millimeters) are the discrepancies (regardless of sign) of the two lines run by the same observer in opposite directions, we are safe to assume that 13.6 millimeters is considerably too large. This has only a theoretical interest, since in taking the mean of the two lines run in this way, for the difference of elevations, the constant is eliminated. But assuming again all errors to be accidental, we may compute the probable error per kilometer.

x = probable error per kilometer.
R = probale error of final resnlt.
D = distance in kilometers.

$R^2 = X^2 D$. $\quad D = 261.36$. $\quad X = \frac{R}{\sqrt{D}}$ $\quad \frac{R}{\sqrt{D}} = 13.6$. $\quad \sqrt{D} = 16.17$.

Therefore probable error per kilometer $= \frac{13.6}{16.17}$

In columns headed "Supports" in tabulation the letters F and P denote foot-plates and pins, respectively, used as rod supports.

In the columns headed "Observer", the observers are represented by letters, as follows: "J" represents J. B. Johnson; "F" represents O. W. Ferguson.

Benches marked with a star (*) are not in the main line. All quantities in the tabulation have been checked either by comparison with the field computation or by computation duplicated by two computers.

Very respectfully, your obedient servant,

O. W. FERGUSON,
Assistant Engineer.

First Lieut. SMITH S. LEACH,
Secretary Mississippi River Commission.

Results of precise leveling, Fulton to Chicago, Ill.

[Bench-marks marked with an asterisk are not in main line of levels.]

Bench.	Distance.	Direction.	Difference of elevation.	V	*r*	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
U. S. P. B. M. 53	0								188.6009		
T. B. M. 1 and 1 *a*	1.14	N	—4.1316	—0.9	0.6		184.4684			F.	J.
		S	—4.1334	+0.9						F.	J.
		Mean	—4.1325								
T. B. M. 2	2.12	N	—1.4160	—1.8	1.2		183.0506			F	F.
		S	—1.4195	+1.7						F.	F.
		Mean	—1.4178								
T. B. M. 4 and 4 *a*	3.81	N	+2.7473	—0.3	0.2		185.7976			P.	F.
		S	+2.7466	+0.4						F.	F.
		Mean	+2.7470								
T. B. M. 5	5.08	N	—0.7441	—0.8	1.4		185.0527			F.	J.
		S	—0.7508	+5.9						F.	J.
		N	—0.7435	—1.4						F.	J.
		S	—0.7412	—3.7						F.	J.
		Mean	—0.7449								
U. S. P. B. M. 55	5.71	N	—1.7640	+0.4	0.3	2.0	183.2891	—0.2	183.2889	F.	J.
		S	—1.7631	—0.5						F.	J.
		Mean	—1.7636								
U. S. P. B. M. 56	5.93	N	+0.3859	—0.3	0.2		183.6747	—0.1	183.6746	F.	J.
		S	+0.3853	+0.3		2.0				F.	J.
		Mean	+0.3856								
T. B. M. 6 and 6 *a*	7.02	N	+2.2218	—0.8	0.5		185.8957			F.	J.
		S	+2.2127†							F.	J.
		N	+2.2191	+1.9						F.	J.
		S	+2.2226	—1.6						F.	J.
		S	+2.2203	+0.7							J.
		Mean	+2.2210								
T. B. M. 9 and 9 *a*	9.55	N	—0.5813	—1.3	0.8		185.3131			F.	F.
		S	—0.5838	+1.2						F.	F.
		Mean	—0.5826								
*U. S. P. B. M. 57 Fulton, Ill.		W	+2.8756	—1.1	0.7	2.3	188.1876	0.0	188.1876	F.	F.
		E	+2.8734	+1.1						F.	F.
		Mean	+2.8745								

† Rejected.

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	*r*	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
*Zero of L. & H. Co., water gauge at Fulton, Ill., 10 feet above low water of 1877.	.....	W	—5.9720	—0.4	0.3	.....	182.2152	..0.2	182.2150	F.	F.
		E	—5.9728	+0.4	.....	.....	.....	.....	.....	F.	F.
		Mean .	—5.9724								
*B. M. 35, Capt. Mackenzie, Fulton.	.....	E	—3.4085	.....	.....	.....	184.7791	—0.1	184.7790	F.	F.
*Low water 1877	.....	.....	—9.0204	.....	.....	.....	179.1682	—0.3	179.1669	F.	F.
*High water 1828....	.....	.....	—2.8991	.....	.....	.....	185.2885	—0.1	185.2884	F.	F.
*High water 1859....	.....	.....	—3.4959	.....	.....	.....	184.6917	—0.1	184.6916	F.	F.
*High water of April 24, 1870.	.....	.....	—3.2800	.....	.....	.....	184.9076	—0.1	184.9075	F.	F.
*High water of June 20, 1880.	.....	.....	—3.0261	.....	.....	.....	185.1615	—0.1	185.1614	F.	F.
*High water of October, 1881.	.....	.....	—3.2674	.....	.....	.....	184.9202	—0.1	184.9201	F.	F.
U. S. P. B. M. 58, Fulton Junction.	10.52	N	—1.5622	—0.5	0.3	2.2	183.7504	—0.1	183.7503	F.	F.
		S	—1.5632	+0.5	.....	.....	.....	.....	.....	F.	F.
		Mean .	—1.5627								
T. B. M. 12 and 12*a* ..	12.05	N	+1.4151	0.0	0.0	.....	185.1655	.....	.....	F.	F.
		S	+1.4151	0.0	.....	.....	.....	.....	.....	F.	F.
		Mean .	+1.4151								
T. B. M. 14	14.42	N	+0.5039	+0.2	0.1	.....	185.6696	.....	.....	F.	J.
		S	+0.5043	—0.2	.....	.....	.....	.....	.....	F.	J.
		Mean .	+0.5041								
U. S. P. B. M. 59.....	14.50	N	+0.1580	0.0	0.0	2.2	185.8276	—0.1	185.8275	F.	J.
		S	+0.1580	0.0	.....	.....	.....	.....	.....	F.	J.
		Mean .	+0.1580								
T. B. M. 15 and 15*a* ..	15.38	N	+2.3443	0.0	0.0	.....	188.1719	.....	.....	F.	J.
		S	+2.3443	0.0	.....	.....	.....	.....	.....	F.	J.
		Mean	+2.3443								
T. B. M. 16 and 16*a* .	16.61	N	+1.3281	+0.3	0.2	.....	189.5003	.....	.....	F.	J.
		S	+1.3288	—0.4	.....	.....	.....	.....	.....	F.	J.
		Mean	+1.3284								
T. B. M. 17 and 17*a* ..	17.99	N	+4.6185	+1.2	0.8	.....	194.1200	.....	.....	F.	F.
		S	+4.6209	—1.2	.....	.....	.....	.....	.....	F.	F.
		Mean .	+4.6197								
T. B. M. 18 and 18*a* ..	18.82	N	—1.8191	—0.8	0.5	.....	192.3001	.....	.....	F.	F.
		S	—1.8207	+0.8	.....	.....	.....	.....	.....	F.	F.
		Mean .	—1.8199								
T . . 20 and 20*a* ..	21.02	N	—2.1712	—1.8	1.2	.....	190.1271	.....	.....	F.	J.
		S	—2.1748	+1.8	.....	.....	.....	.....	.....	F.	J.
		Mean .	—2.1730								
T. B. M. 21 and 21*a* ..	21.57	N	+0.3084	—0.1	0.1	.....	190.4354	.....	.....	F.	F.
		S	+0.3082	+0.1	.....	.....	.....	.....	.....	F.	F.
		Mean .	+0.3083								
*U. S. P. B. M. 60, Thomson, Ill.	.....	E	+0.4246	—0.4	0.3	2.7	190.8596	+0.1	190.8597	F.	F.
	.....	W	+0.4237	+0.5	.....	.....	.....	.....	.....	F.	F.
		Mean	+0.4242								
T. B. M. 23 and 23*a* ..	23.86	N	+0.1223	—0.3	0.2	.....	190.5574	.....	.....	F.	F.
		S	+0.1216	+0.4	.....	.....	.....	.....	.....	F.	F.
		Mean .	+0.1220								

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	*r*	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
T. B. M. 24	25.04	N	—0.1848	—1.1	1.4		190.3715			F.	J.
		S	—0.1907	+4.8						F.	J.
		N	—0.1808	—5.1						F.	J.
		S	—0.1872	+1.3						F.	J.
		Mean	—0.1859								
T. B. M. 25 and 25 *a*	25.84	N	—0.0195	—0.9	0.6		190.3511			F.	J.
		S	—0.0214	+1.0						F.	J.
		Mean	—0.0204								
T. B. M. 26 and 26 *a*	26.60	N	+0.5084	—1.2	0.8		190.8583			F.	J.
		S	+0.5059	+1.3						F.	J.
		Mean	+0.5072								
T. B. M. 27 and 27 *a*	28.02	N	—0.1509	+0.6	0.4		190.7080			F.	F.
		S	—0.1479	−0.6						F.	F.
		Mean	—0.1503								
T. B. M. 28 and 28 *a*	28.95	N	+1.2156	—2.0	1.3		191.9216			F.	J.
		S	+1.2117	+1.9						F.	J.
		Mean	+1.2136								
T. B. M. 30 and 30 *a*	31.32	N	+0.0589	+3.5	2.4		191.9840			F.	F.
		S	+0.0660	—3.6						F.	F.
		Mean	+0.0624								
T. B. M. 32 and 32 *a*	33.16	N	—5.8730	+0.4	0.2		186.1114			F.	J.
		S	—5.8723	—0.3						F.	J.
		Mean	—5.8726								
T. B. M. 34 and 34 *a*	34.88	N	—0.9933	+2.5	1.7		185.1206			F.	F.
		S	—0.9883	—2.5						F.	F.
		Mean	—0.9908								
T. B. M. 35	35.71	N	+0.1533	+0.5	0.3		185.2744			F.	F.
		S	+0.1543	—0.5						F.	F.
		Mean	+0.1538								
*U. S. P. B. M. 61		E	—0.2706	—0.2	0.1	4.6	185.0036	—0.1	185.0035	F.	F.
		W	—0.2710	+0.2						F.	F.
		Mean	—0.2708								
T. B. M. 37	36.83	N	+1.2646	—2.4	1.6		186.5366			F.	J.
		S	+1.2599	+2.3						F	J.
		Mean	+1.2622								
*T. B. M. 38 and 38*a*		N	—0.1310	+1.3	0.9		186.4069			F.	F.
		S	—0.1284	—1.3						F.	F.
		Mean	—0.1297								
*U. S. P. B. M. 62, at Savanna, Ill.		N	+0.1711	—0.1	0.1	4.9	186.5779	—0.1	186.5778	F.	F.
		N	+0.1709	+0.1						F.	J.
		Mean	+0.1710								
*U. S. P. B. M. 63, at Savanna, Ill.		E	+2.4468	0.0	0.0	4.9	188.8537	0.0	188.8537	F.	F.
		W	+2.4468	0.0						F.	F.
		Mean	+2.4468								
*B. M. 34 of Captain Mackenzie, Savanna, Ill.		N	+0.1715	+0.5	0.3	4.9	186.5789	—0.1	186.5788	F.	F.
		N	+0.1725	—0.5						F.	J.
		Mean	+0.1720								

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	*r*	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
*High water of June 25, 1881, Savanna, Ill.	.....	N.....	+0.2748	—4.6	3.0	.....	186.6971	—0.1	186.6970	F.	F.
		N.....	+0.2857	+4.5	.....	.....	.....	.....	.....	F.	J.
		Mean.	+0.2902								
*High water of October 26, 1881, Savanna, Ill.	.....	N.....	−0.0162	+9.7	6.5	.....	186.4004	—0.1	186.4003	F.	F.
		N.....	+0.0032	—9.7	.....	.....	.....	.....	.....	F.	J.
		Mean.	−0.0065								
T. B. M. 39 and 39 *a*..	37.89	N.....	—0.1102	+0.2	0.1	.....	186.4266	.....	.....	F.	J.
		S.....	—0.1098	—0.2	.....	.....	.....	.....	.....	F.	J.
		Mean.	−0.1100								
T. B. M. 40 and 40 *a*..	39.21	E.....	+0.2248	+1.2	0.8	.....	186.6526	.....	.....	F.	F.
		W.....	+0.2272	—1.2	.....	.....	.....	.....	.....	F.	F.
		Mean.	+0.2260								
U. S. P. B. M. 64, Plum River.	40.90	E.....	−0.4294	+2.6	1.7	5.2	187.0846	0.0	187.0846	F.	F.
		W.....	+0.4345	—2.5	.....	.....	.....	.....	.....	F.	F.
		Mean.	+0.4320								
T. B. M. 41 and 41 *a*..	42.42	E.....	+13.6982	+1.0	0.7	.....	200.7838	.....	.....	F.	J.
		W.....	+13.7003	—1.1	.....	.....	.....	.....	.....	F.	J.
		Mean.	+13.6992								
T. B. M. 42	43.87	E.....	+10.1222	+2.2	1.4	.....	210.9082	.....	.....	F.	J.
		W.....	+10.1265	—2.1	.....	.....	.....	.....	.....	F.	J.
		Mean.	+10.1244								
*U. S. P. B. M. 65.....	.....	N.....	−0.5942	—0.4	0.3	5.4	211.5020	+0.7	211.5027	F.	F.
		W.....	+0.5933	+0.5	.....	.....	.....	.....	.....	F.	F.
		Mean.	+0.5938								
T. B. M. 43 and 43 *a*..	45.19	E.....	+7.0019	+2.7	1.8	.....	217.9128	.....	.....	F.	J.
		W.....	+7.0072	—2.6	.....	.....	.....	.....	.....	F.	J.
		Mean.	+7.0046								
T. B. M. 44	46.50	E.....	+7.4844	—4.2	1.3	.....	225.3930	.....	.....	F.	F.
		W.....	+7.4749	+5.3	.....	.....	.....	.....	.....	F.	F.
		E.....	+7.4800	+0.2	.....	.....	.....	.....	.....	F.	F.
		W.....	+7.4815	—1.3	.....	.....	.....	.....	.....	F.	F.
		Mean.	+7.4802								
T. B. M. 45	47.49	E.....	+12.7588	—0.2	0.1	.....	238.1516	.....	.....	F.	F.
		W.....	+12.7584	+0.2	.....	.....	.....	.....	.....	F.	F.
		Mean.	+12.7586								
T. B. M. 46 and 46 *a*..	48.96	E.....	+8.4980	—1.6	1.0	.....	246.6480	.....	.....	F.	F.
		W.....	+8.4949	+1.5	.....	.....	.....	.....	.....	F.	F.
		Mean.	+8.4964								
T. B. M. 47 and 47 *a*..	50.39	E.....	+0.5278	+0.9	0.6	.....	247.1767	.....	.....	F.	J.
		W.....	+0.5296	—0.9	.....	.....	.....	.....	.....	F.	J.
		Mean.	+0.5287								
T. B. M. 48 and 48 *a*..	51.22	E.....	—3.4139	—1.4	0.9	.....	243.7614	.....	.....	F.	J.
		W.....	—3.4167	+1.4	.....	.....	.....	.....	.....	F.	J.
		Mean.	−3.4153								
T. B. M. 49 and 49 *a*..	52.20	E.....	+3.4158	—1.0	0.7	.....	247.1762	.....	.....	F.	F.
		W.....	+3.4138	+1.0	.....	.....	.....	.....	.....	F.	F.
		Mean.	+3.4148								

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	r	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
		Km.	*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
T. B. M. 50	53.84	E	+7.1070	+0.4	0.3	.....	254.2836	.....	.....	F.	F.
		W	+7.1079	—0.5	.....	.....	.....	.....	.....	F.	F.
		Mean	+7.1074								
*U. S. P. B. M. 66, Mount Carroll.	.....	E	+0.8273	.....	.....	6.1	255.1109	+1.9	255.1128	F.	J.
T. B. M. 51 and 51 *a*	55,47	E	+2.5919	+1.1	0.7	.....	256.8766	.....	.....	F.	J.
		W	+2.5940	—1.0	.....	.....	.....	.....	.....	F.	J.
		Mean	+3.5930								
T. B. M. 52 and 52 *a*	56.36	E	—2.1243	+0.8	0.5	.....	254.7531	.....	.....	F.	J.
		W	—2.1227	—0.8	.....	.....	.....	.....	.....	F.	J.
		Mean	—2.1235								
T. B. M 53 and 53 *a*	57.38	E	+3.4413	—0.3	0.2	.....	258.1941	.....	.....	F.	F.
		W	+3.4406	+0.4	.....	.....	.....	.....	.....	F.	F.
		Mean	+3.4410								
T. B. M. 55	59.77	E	—11.2762	+1.8	1.2	.....	246.9197	.....	.....	F.	F.
		W	—11.2727	—1.7	.....	.....	.....	.....	.....	F.	F.
		Mean	—11.2744								
*U. S. P. B. M. 67	.....	E	—0.4090	—0.2	0.1	6.3	246.5105	+1.7	246.5122	F.	J.
		W	—0.4094	+0.2	.....	.....	.....	.....	.....	F.	F.
		Mean	—0.4092								
T. B. M. 56	61.02	E	—2.0957	—1.3	0.9	.....	244.9127	.....	.....	F.	J.
		W	—2.0083	+1.3	.....	.....	.....	.....	.....	F.	J.
		Mean	—2.0070								
T. B. M. 57 and 57 *a*	62.21	E	+11.2393	—1.3	0.9	.....	256.1507	.....	.....	F.	J.
		W	—11.2367	+1.3	.....	.....	.....	.....	.....	F.	J.
		Mean	+11.2380								
T. B. M. 58	62.96	E	+7.4822	0.0	0.0	.....	263.6329	.....	.....	F.	J.
		W	+7.4822	0.0	.....	.....	.....	.....	.....	F.	J.
		Mean	+7.4822								
T. B. M. 59 and 59 *a*	53.39	E	+3.3855	+0.4	0.3	.....	267.0188	.....	.....	F.	J.
		W	+3.3863	—0.4	.....	.....	.....	.....	.....	F.	J.
		Mean	+3.3859								
T. B. M. 61 and 61 *a*	66.12	E	+7.6466	—0.6	0.4	.....	274.6648	.....	.....	F.	F.
		W	+7.6455	+0.5	.....	.....	.....	.....	.....	F.	F.
		Mean	+7.6460								
*U. S. P. B. M. 68, at Lanark, Ill.	.....	E	+0.6166	—0.2	0.1	6.4	275.2816	+2.5	275.2841	....	F.
		W	+0.6170	—0.5	.....	.....	.....	.....	.....	....	F.
		Mean	+0.6168								
T. B. M. 62	67.00	E	—5.0568	+2.2	0.8	.....	269.6102	.....	.....	P.	F.
		W	—5.0517	—2.9	.....	.....	.....	.....	.....	F.	F.
		E	—5.0542	—0.4	.....	.....	.....	.....	.....	P.	F.
		W	—5.0559	+1.3	.....	.....	.....	.....	.....	P.	F.
		Mean	—5.0546								
T. B. M. 63 and 63 *a*	67.60	E	—4.0752	—0.3	0.2	.....	265.5347	.....	.....	P.	F.
		W	—4.0758	+0.3	.....	.....	.....	.....	.....	P.	F.
		Mean	—4.0755								

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	r	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
T. B. M. 64 and 64 *a* ..	69.00	E	—6.7111	0.0	0.7	.....	258.8236	.....	.....	F.	J.
		W	—6.7137	+2.6	.....	.....	.....	.....	.....	F.	J.
		E	—6.7088	—2.3	.....	.....	.....	.....	.....	P.	J.
		W	—6.7109	—0.2	.....	.....	.....	.....	.....	P.	J.
		Mean	—6.7111								
U. S. P. B. M. 69, Lanark Junction.	70.79	E	+3 3617	—2.9	1.9	6.8	262.1824	+2.1	262.1845	P.	J.
		W	+3.3559	+2.9	.....	.....	.....	.....	.....	P.	J.
		Mean .	+3.3588							F.	J.
T. B. M. 66	71.70	E	+2.2897	+4.4	.....	.....	.....	.....	.....	P.	F.
		W	+2.2977	—3.8	1.1	.....	264.4765	.....	.....	P.	F.
		E	+2.2950	—0 9	.....	.....	.....	.....	.....	P.	F.
		W	+2.2937	+0.4	.....	.....	.....	.....	.....	P.	F.
		Mean .	+2.2947								
T. B. M. 67 and 67 *a* ..	72.71	E	+2.6819	+1.3	0.9	.....	267.1597	.....	.....	P.	F.
		W	+2.6846	—1.4	.....	.....	.....	.....	.....	P.	F.
		Mean .	+2.6832								
T. B. M. 68	73.57	E	+2.7432	—0.1	0.1	.....	269.9028	.....	.....	F.	F.
		W	+2.7430	—0.1	.....	.....	.....	.....	.....	F.	F.
		Mean .	+2.7431								
T. B. M. 69 and 69 *a* ..	74.49	E	+3.0886	+2.4	0.6	.....	272.9938	.....	.....	F.	F.
		W	+3.0928	—1.8	.....	.....	.....	.....	.....	F.	F.
		E	—3.0917	—0.7	.....	.....	.....	.....	.....	F.	F.
		W	+3.0908	+0.2	.....	.....	.....	.....	.....	F.	F.
		Mean .	+3.0910								
T. B. M. 71 and 71 *a* ..	76.91	E	+18.8505	—1.9	1.3	.....	291.8424	.....	.....	F.	J.
		W	+18.8466	+2.0	.....	.....	.....	.....	.....	F.	J.
		Mean .	+18.8486								
T. B. M. 72	77.35	E	+2.3042	+0.2	0.2	.....	294.1468	.....	.....	F.	J.
		W	+2.3047	—0.3	.....	.....	.....	.....	.....	F.	J.
		Mean .	+2.3044								
*U. S. P. B. M. 70	.....	E	+0.6898	—0.2	0.1	7.1	294.8364	+3.1	294.8395	F.	J.
		W	+0.6895	+0.1	.....	.....	.....	.....	.....	F.	J.
		Mean .	+0.6896								
T. B. M. 73 and 73 *a* ..	77.81	E	+4.4521	—1.9	0.6	.....	298.5970	.....	.....	F.	J.
		W	+4.4480	+2.2	.....	.....	.....	.....	.....	F.	J.
		E	+4.4510	—0.8	.....	.....	.....	.....	.....	F.	J.
		W	+4.4498	+0.4	.....	.....	.....	.....	.....	F.	J.
		Mean .	+4.4502								
T. B. M. 74	78.74	E	+2.2901	—1.9	1.3	.....	300.8852	.....	.....	F.	J.
		W	+2.2863	+1.9	.....	.....	.....	.....	.....	F.	J.
		Mean .	+2.2882								
T. B. M. 75 and 75 *a* ..	79.72	E	—3.1615	+4.2	0.8	.....	297.7279	.....	.....	F.	J.
		W	—3.1520	—5.3	.....	.....	.....	.....	.....	F.	J.
		E	—3.1611	+3.8	.....	.....	.....	.....	.....	F.	J.
		W	—3.1534	—3.9	.....	.....	.....	.....	.....	F.	J.
		E	—3.1585	+1.2	.....	.....	.....	.....	.....	F.	J.
		W	—3.1598	+2.5	.....	.....	.....	.....	.....	F.	J.
		E	—3.1560	—1.3	.....	.....	.....	.....	.....	F.	F.
		W	—3.1564	—0.9	.....	.....	.....	.....	.....	F.	F.
		Mean .	--3.1573								

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	*r*	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
T. B. M. 77 and 77 *a*..	82.04	E.....	—8.1441	—2.7	1.8	.....	289.5811	.....	.....	F.	F.
		W	—8.1496	+2.8	.....	.....	.....	.....	.....	F.	F.
		Mean .	—8.1468								
T. B. M, 78 and 78 *a*..	83.03	E.....	+1.7236	—0.9	0.6	.....	291.3038	.....	.....	F.	F.
		W	+1.7218	+0.9	.....	.....	.....	.....	.....	F.	F.
		Mean .	+1.7227								
T. B. M. 80 and 80 *a*..	85.24	E.....	—4.6831	+1.5	1.0	.....	286.6222	.....	.....	F.	F.
		W	—4.6801	—1.5	.....	.....	.....	.....	.....	F.	F.
		Mean .	—4.6816								
U. S. P. B. M. 71, Forreston Junction.	87.99	E.....	—13.2258	—1.0	0.7	7.6	273.3954	+2 5	273.3979	F.	J.
		W	—13.2279	+1.1	.....	.....	.....	.....	.....	F.	J.
		Mean .	—13.2268								
T. B. M. 84 and 84 *a*..	90.05	E.....	—10.9234	+1.4	1.0	.....	262.4734	.....	.....	F.	J.
		W	—10.9205	—1.5	.....	.....	.....	.....	.....	F.	J.
		Mean .	—10.9220								
T. B. M. 85	91.23	E.....	—1.9385	—0.9	0.6	.....	260.5340	.....	.....	F.	F.
		W	—1.9403	+0.9	.....	.....	.....	.....	.....	F.	F.
		Mean .	—1.9394								
T. B. M. 86 and 86 *a*..	92.04	E.....	—0.3271	—0.1	0.0	.....	260.2068	.....	.....	F.	F.
		W	—0.3272	0.0	.....	.....	.....	.....	.....	F.	F.
		Mean .	—0.3272								
T. B. M. 87	92.68	E.....	+1.1567	—0.1	0.0	.....	261.3634	.....	.....	F.	F.
		W	+1.1566	0.0	.....	.....	.....	.....	.....	F.	F.
		Mean .	+1.1566								
T. B. M. 88 and 88 *a*..	93.56	E.....	—5.7337	+2.5	0.9	.....	255.6322	.....	.....	F.	F.
		W	—5.7289	—2.3	.....	.....	.....	.....	.....	F.	F.
		E.....	—5.7309	—0.3	.....	.....	.....	.....	.....	F.	F.
		Mean .	—5.7312								
T. B. M. 90 and 90 *a*..	95.04	E.....	—11.5999	—1.1	0.7	.....	244.0312	.....	.....	F.	J.
		W	—11.6020	+1.0	.....	.....	.....	.....	.....	F.	J.
		Mean .	—11.6010								
T. B. M. 92	96.89	E.....	—10.4866	+1.2	0.8	.....	233.5458	.....	.....	F.	J.
		W	—10.4843	—1.1	.....	.....	.....	.....	.....	F.	J.
		Mean .	—10.4854								
* U. S. P. B. M. 72, at Adeline, Ill.	.....	E.....	+1.3836	.....	.....	7.8	234.9294	+1.3	234.9307	F.	J.
T. B. M., 93 and 93 *a*.	97.55	E.....	—0.1397	—1.3	0.9	.....	233.4048	.....	.....	F.	J.
		W	—0.1423	+1.3	.....	.....	.....	.....	.....	F.	J.
		Mean .	—0.1410								
T. B. M. 95 and 95 *a*..	99.65	E.....	—5.7039	—0.8	0.5	.....	227.7001	.....	.....	F.	F.
		W	—5.7055	+0.8	.....	.....	.....	.....	.....	F.	F.
		Mean .	—5.7047								
T. B. M. 96 and 96 *a*..	100.76	E.....	—1.8277	—0.1	0.1	.....	225.8723	.....	.....	F.	F.
		W	—1.8279	+0.1	.....	.....	.....	.....	.....	F.	F.
		Mean .	—1.8278								

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	*r*	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
T. B. M. 97 and 97 *a*	101.98	E	—2.0460	+0.4	0.3		223.8267			F.	J.
		W	—2.0451	—0.5						F.	J.
		Mean	—2.0456								
T. B. M. 99 and 99 *a*	104.22	E	—2.6565	—1.9	1.3		221.1683			F.	J.
		W	—2.6603	+1.9						F.	J.
		Mean	—2.6584								
*U. S. P, B. M. 73, Leaf River, Illinois.			+1.0253			8.0	222.1936	+1.0	222.1946	F.	J.
T. B. M. 100	105.37	E	+0.3356	—2.1	1.4		221.5018			F.	F.
		W	+0.3314	+2.1						F.	F.
		Mean	+0.3335								
T. B. M. 101 and 101 *a*	106.45	E	+5.8408	—2.6	1.2		227.3400			F.	F.
		W	+5.8336	+4.6						F.	F.
		E	+5.8375	+0.7						F.	F.
		W	+5.8408	—2.6						F.	F.
		Mean	+5.8382								
T. B. M. 102 and 102 *a*	107.82	E	+12.1655	—0.1	0.0		239.5054			F.	J.
		W	+12.1654	0.0						F.	J.
		Mean	+12.1654								
T. B. M. 105 and 105 *a*	111.05	E	—4.8799	—2.1	1.4		234.6234			F.	J.
		W	—4.8842	+2.2						F.	J.
		Mean	—4.8820								
T. B. M. 106	112.22	E	—7.7454	+1.8	1.0		226.8798			F.	F.
		W	—7.7393	—4.3						F.	F.
		E	—7.7454	+1.8						F.	F.
		W	—7.7443	+0.7						F.	F.
		Mean	—7.7436								
T. B. M. 107	113.33	E	—7.9777	+2.0	0.8		218.9041			F.	F.
		W	—7.9724	—3.3						F.	F.
		E	—7.9767	+1.0						F.	F.
		W	—7.9760	+0.3						F.	F.
		Mean	—7.9757								
T. B. M. 108 and 108 *a*	114.44	E	—2.2023	+1.7	1.1		216.7035			F.	F.
		W	—2.1990	—1.6						F.	F.
		Mean	—2.2006								
T. B. M. 109 and 109 *a*	115.42	E	+8.5013	—0.9	0.6		225.2039			F.	F.
		W	+8.4996	+0.8						F.	F.
		Mean	+8.5004								
T. B. M. 110 and 110 *a*	116.55	E	+2.1193	+0.5	0.3		227.3237			F.	J.
		W	+2.1202	—0.4						F.	J.
		Mean	+2.1198								
*U. S. P. B. M. 74, Byron,		E	+1.0696	—0.2	0.1	8.5	228.3931	+1.2	228.3943	F.	F.
		E	+1.0692	+0.2						F.	J.
		Mean	+1.0694								
T. B. M. 111 and 111 *a*	117.75	E	—9.9869	+2.2	1.5		217.3391			F.	J.
		W	—9.9823	—2.3						F.	J.
		Mean	—9.9846								

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	*r*	R	Elevation.	Rod correction.	Corrected elevation	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
U. S. P. B. M. 75, on bridge over Rock River.	118.63	E	+0.0764	—1.5	1.0	.....	217.4140	+0.8	217.4148	F.	F.
		W	+0.0734	+1.5	.....	.....	.....	.....	.....	F.	F.
		Mean	+0.0749								
T. B. M. 112 and 112*a*	119.36	E	+1.6651	—0.9	0.6	.....	219.0782	.....	.....	F.	F.
		W	+1.6633	+0.9	.....	.....	.....	.....	.....	F.	F.
		Mean	+1.6642								
T. B. M. 113 and 113*a*	121.00	E	+1.4311	+0.7	0.4	.....	220.5100	.....	.....	F.	F.
		W	+1.4324	—0.6	.....	.....	.....	.....	.....	F.	F.
		Mean	+1.4318								
T. B. M. 115 and 115*a*	122.75	E	—1.4952	—0.8	0.5	.....	219.0140	.....	.....	F.	J.
		W	—1.4967	—0.7	.....	.....	.....	.....	.....	F.	J.
		Mean	—1.4960								
T. B. M. 116 and 116*a*	123.80	E	+1.7028	+1.4	1.0	.....	220.7182	.....	.....	F.	J.
		W	+1.7057	—1.5	.....	.....	.....	.....	.....	F.	J.
		Mean	+1.7042								
[a] U. S. P. B. M. 76 Stillman Valley.	.....	.....	+0.7904	—0.2	0.1	8.8	221.5084	+1.0	221.5094	F.	F.
			+0.7901	+0.1	.....	.....	.....	.....	.....	F.	J.
		Mean	+0.7902								
T. B. M. 117 and 117*a*	124.94	E	+2.7427	+0.9	0.9	.....	223.4618	.....	.....	F.	F.
		W	+2.7473	—3.7	.....	.....	.....	.....	.....	F.	F.
		E	+2.7431	+0.5	.....	.....	.....	.....	.....	F.	F.
		W	+2.7412	+2.4	.....	.....	.....	.....	.....	F.	F.
		Mean	+2.7436								
T. B. M. 118 and 118*a*.	125.86	E	+7.5763†	.....	0.5	.....	231.0502	.....	.....	F.	J.
		W	+7.5867	+1.7	.....	.....	.....	.....	.....	F.	J.
		E	+7.5904	—2.0	.....	.....	.....	.....	.....	F.	J.
		W	+7.5880	+0.4	.....	.....	.....	.....	.....	F.	J.
		E	+7.5883	+0.1	.....	.....	.....	.....	.....	F.	J.
		Mean	+7.5884								
T. B. M. 119 and 119*a*.	126.54	E	+6.5616	—0.9	0.6	.....	237.6109	.....	.....		
		W	+6.5598	+0.9	.....	.....	.....	.....	.....		
		Mean	+6.5607								
T. B. M. 120.....	127.42	E	+ 6.6246	+1.2	1.1	.....	244.2367	.....	.....	F.	F.
		W	+ 6.6307	—4.9	.....	.....	.....	.....	.....	F.	F.
		E	+ 6.6230	+2.8	.....	.....	.....	.....	.....	F.	F.
		W	+ 6.6250	+0.8	.....	.....	.....	.....	.....		
		Mean	+ 6.6258								
T. B. M. 121 and 121*a*	128.26	E	+ 6.8405	+0.6	0.4	.....	251.0778	.....	.....	F.	F.
		W	+ 6.8417	—0.6	.....	.....	.....	.....	.....	F.	F.
		Mean	+ 6.8411								
U. S. P. B. M. 77	128.50	E	+ 1.4353	+0.4	0.1	9.0	252.5135	+1.9	252.5154	F.	F.
		W	+ 1.4354	+0.3	.....	.....	.....	.....	.....	F.	F.
		E	+ 1.4356	+0.1	.....	.....	.....	.....	.....	F.	F.
		W	+ 1.4363	—0.6	.....	.....	.....	.....	.....	F.	F.
		Mean	+ 1.4357								

† Rejected.

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	r	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
T. B. M. 122 and 122 *a*.	129.65	E....	+ 2.9136	−1.6	1.1	.....	255.4255	.....	.....	F.	F.
		W	+ 2.9104	+1.6	.....	.....	.....	.....	.....	F.	F.
		Mean .	+ 2.9120								
T. B. M. 124 and 124 *a*.	131.14	E.....	− 9.3354	−0.6	0.4	.....	246.0895	.....	.....	F.	J.
		W	− 9.3367	+0.7	.....	.....	.....	.....	.....	F.	J.
		Mean .	− 9.3360								
T. B. M. 125 and 125 *a*.	132.34	E.....	− 6.0219	−0.2	0.1	.....	240.0674	.....	.....	F.	J.
		W	− 6.0223	+0.2	.....	.....	.....	.....	.....	F.	J.
		Mean .	− 6.0221								
T. B. M. 126 and 126 *a*.	133.78	E.....	− 0.9345	−0.5	0.3	.....	239.1324	.....	.....	F.	F.
		W	− 0.9355	+0.5	.....	.....	.....	.....	.....	F.	F.
		Mean .	− 0.9350								
T. B. M. 127 and 127 *a*.	134.76	E.....	+ 2.5593	+1.5	1.0	.....	241.6932	.....	.....	F.	F.
		W	+ 2.5624	−1.6	.....	.....	.....	.....	.....	F.	F.
		Mean .	+ 2.5608								
T. B. M. 128 and 128 *a*	135.83	E.....	− 0.1398	+2.4	1.6	.....	241.5558	.....	.....	F.	J.
		W	− 0.1351	−2.3	.....	.....	.....	.....	.....	F.	J.
		Mean .	− 0.1374								
T. B. M. 130 and 130 *a*.	138.76	E. ..	+20.0340	−1.4	1.0	.....	261.5884	.....	.....	F.	F.
		W	+20.0311	+1.5	.....	.....	.....	.....	.....	F.	F.
		Mean .	+20.0326								
*U. S. P. B. M 78, at Monroe, Ill.	.....	.....	+ 1.4012	.....	.....	9.3	262.9896	+2.2	262.9918	F.	F.
T. B. M. 133 and 133 *a*.	142.07	E. ..	− 1.0848	+2.8	1.9	.....	260.5064	.....	.....	F.	F.
		W	− 1.0792	−2.8	.....	.....	.....	.....	.....	F.	F.
		Mean .	− 1.0820							F.	F.
T. B. M. 135 and 135 *a*.	144.50	E.....	−15.9327	−1.1	0.7	.....	244.5726	.....	.....	F.	F.
		W	−15.9348	+1.0	.....	.....	.....	.....	.....	F.	F.
		Mean .	−15.9338								
*U. S. P. B. M at Fielding, Ill.	.....	.....	+ 1.0426	.....	.....	9.5	245.6152	+1.7	245.6169	F.	F.
T. B. M. 137 and 137 *a*.	146.84	E....	− 0.4699	+0.5	0.4	.....	244.1032	.....	.....	F.	F.
		W ...	− 0.4688	−0.6	.....	.....	.....	.....	.....	F.	F.
		Mean .	− 0.4694								
T. B. M. 138 and 138 *a*.	148.42	E	− 8.3335	+0.1	0.1	.....	235.7698	.....	.....	F.	F.
		W	− 8.3332	−0.2	.....	.....	.....	.....	.....	F.	F.
		Mean .	− 8.3334								
T. B. M. 139 and 139 *a*.	149.08	E.....	+ 2.9648	+1.5	1.0	.....	238.7361	.....	.....	F.	A.
		W	+ 2.9677	−1.4	.....	.....	.....	.....	.....	F.	A.
		Mean .	+ 2.9663								
T. B. M. 140 and 140 *a*.	150.46	E.....	+ 3.5606	+0.4	0.3	.....	242.2971	.....	.....	F.	F.
		W	+ 3.5614	−0.4	.....	.....	.....	.....	.....	F.	F.
		Mean .	+ 3.5610								

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	*r*	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
T. B. M. 141 and 141 *a*.	151.44	E.....	—3.2276	—3.4	0.8	.....	239.0661	.....	.....	F.	A.
		W	—3.2335	+2.5	.....	.....	.....	.....	.....	F.	A.
		E....	—3.2309	—0.1	.....	.....	.....	.....	.....	F.	A.
		W	—3.2320	+1.0	.....	.....	.....	.....	.....	F.	A.
		Mean .	—3.2310								
*U. S. P. B. M. 80, Kirkland.	.....	.....	+3.1488	- 0.4	0.2	9.6	242.2145	+1.6	242.2161	F.	F.
			+3.1481	+0.3	.....	.....	.....	.....	.....	F.	F.
		Mean .	+3.1484								
T. B. M. 142 and 142 *a*.	152.30	E.....	—0.1393	—1.9	1.3	.....	238.9249	.....	.....	F.	A.
		W	—0.1431	+1.9	.....	.....	.....	.....	.....	F.	A.
		Mean .	—0.1412								
T. B. M. 143 and 143 *a*.	153.46	E.....	+2.2405	+1.2	0.8	.....	241.1666	.....	.....	F.	A.
		W	+2.2429	—1.2	.....	.....	.....	.....	.....	F.	A.
		Mean .	+2.2417								
T. B. M. 145 and 145 *a*.	155.90	E.....	+6.0062	—0.6	0.4	.....	247.1722	.....	.....	F.	F.
		W	+6.0051	+0.5	.....	.....	.....	.....	.....	F.	F.
		Mean .	+6.0056								
T. B. M. 147 and 147 *a*.	158.36	E.....	+4.7315	+4.0	2.7	.....	251.9077	.....	.....	F.	F.
		W	+4.7395	—4.0	.....	.....	.....	.....	.....	F.	F.
		Mean .	+4.7355								
T. B. M. 148 and 148 *a*.	159.79	E.....	—3.0369	—0.3	0.2	.....	248.8705	.....	.....	F.	J.
		W	—3.0374	+0.2	.....	.....	.....	.....	.....	F.	J.
		Mean .	—3.0372								
*U. S. P. B. M. 81, Kingston.	.....	.....	+2.5376	—0.2	0.1	10.1	251.4079	+1.8	251.4097	F.	J.
			+2.5372	+0.2	.....	.....	.....	.....	.....	F.	F.
		Mean .	+2.5374								
T. B. M. 149 and 149 *a*.	160.71	E.....	+4.6801	—1.9	1.2	.....	253.5487	.....	.....	F,	J.
		W	+4.6764	+1.8	.....	.....	.....	.....	.....	F.	J.
		Mean .	+4.6782								
T. B. M. 151 and 151 *a*.	163.08	E.....	—3.5879	+0.2	0.1	.....	249.9610	.....	.....	F.	J.
		W	—3.5875	—0.2	.....	.....	.....	.....	.....	F.	J.
		Mean .	—3.5877								
T. B. M. 152 and 152 *a*.	164.51	E.....	+8.5116	+1.0	0.7	.....	258.4736	.....	.....	F.	F.
		W	+8.5137	—1.1	.....	.....	.....	.....	.....	F.	F.
		Mean .	+8.5126								
*U. S. P. B. M. 82, at Genoa, Ill.	.....	.....	+3.2111	—0.4	0.2	10.2	261.6843	+2.1	261.6864	F.	J.
			+3.2104	+0.3	.....	.....	.....	.....	.....	F.	F.
		Mean	+3.2107								
T. B. M. 153 and 153 *a*.	165.50	E.....	+1.6405	—0.7	0.5	.....	260.1134	.....	.....	F.	F.
		W	+1.6391	+0.7	.....	.....	.....	.....	.....	F.	F.
		Mean .	+1.6398								
T. B. M. 155 and 155 *a*.	167.37	E.....	—0.7009	+7.5	1.9	.....	259.4200	.....	.....	F.	F.
		W	—0.6876	—5.8	.....	.....	.....	.....	.....	F.	F.
		E.....	—0.6907	—2.7	.....	.....	.....	.....	.....	F.	F.
		W	—0.6945	+1.1	.....	.....	.....	.....	.....	F.	F.
		Mean .	—0.6934								

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	*r*	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
T. B. M. 157 and 157 *a*.	169.72	E.....	+5.4620	—1.7	1.1	.....	264.8803	.....	.....	F.	J.
		W....	+5.4586	+1.7	.....	.....	.....	.....	.....	F.	J.
		Mean.	+5.4603								
T. B. M. 158.....	170.74	E.....	+3.2858	+1.3	2.0	.....	268.1674	.....	.....	F.	J.
		W....	+3.2957	—8.6	.....	.....	.....	.....	.....	F.	J.
		E.....	+3.2821	+5.0	.....	.....	.....	.....	.....	F.	J.
		W....	+3.2849	+2.2	.....	.....	.....	.....	.....	F.	J.
		Mean.	+3.2871								
T. B. M. 159 and 159 *a*.	171.91	E.....	—4.6466	+0.8	1.9	.....	263.5216	.....	.....	F.	J.
		W....	—4.6378	—8.0	.....	.....	.....	.....	.....	F.	J.
		E.....	—4.6509	+5.1	.....	.....	.....	.....	.....	F.	J.
		W....	—4.6478	+2.0	.....	.....	.....	.....	.....	F	J.
		Mean.	—4.6458								
T. B. M. 161 and 161 *a*.	174.32	E.....	+3.0807	—0.2	0.1	.....	266.6021	.....	.....	F.	F.
		W....	+3.0803	+0.2	.....	.....	.....	.....	.....	F.	F.
		Mean	+3.0805								
T. B. M. 162 and 162 *a*.	176.23	E.....	+3.5047	+1.0	0.7	.....	270.1078	.....	.....	F.	F.
		W....	+3.5067	—1.0	.....	.....	.....	.....	.....	F.	F.
		Mean.	+3.5057								
T. B. M. 164 and 164 *a*	178.06	E.....	+7.7493	—2.7	1.8	.....	277.8544	.....	.....	F.	F.
		W....	+7.7439	+2.7	.....	.....	.....	.....	.....	F.	F.
		Mean.	+7.7466								
* U. S. P. B. M. 83, Hampshire, Ill.	.....	.....	+2.6225	+0.1	0.1	11.0	280.4770	+2.7	280.4797	F.	J.
			+2.6228	—0.2	.....	.....	.....	.....	.....	F.	F.
		Mean.	+2.6226								
T. B. M. 165.....	178.95	E.....	+5.5515	+0.9	0.6	.....	283.4068	.....	.....	F.	J.
		W....	+5.5550	—2.6	.....	.....	.....	.....	.....	F.	J.
		E.....	+5.5515	+0.9	.....	.....	.....	.....	.....	F.	J.
		W....	+5.5515	+0.9	.....	.....	.....	.....	.....	F.	J.
		Mean.	+5.5524								
T. B. M. 166 and 166 *a*.	180.12	E.....	+ 6.3176	+2.6	1.0	.....	289.7270	.....	.....	F.	J.
		W....	+ 6.3230	—2.8	.....	.....	.....	.....	.....	F.	J.
		E.....	+ 6.3127	+7.5	.....	.....	.....	.....	.....	F.	J.
		W....	+ 6.3193	+0.9	.....	.....	.....	.....	.....	F.	J.
		E.....	+ 6.3200	+0.2	.....	.....	.....	.....	.....	F.	J.
		W....	+ 6.3263	—6.1	.....	.....	.....	.....	.....	F.	J.
		E.....	+ 6.3195	+0.7	.....	.....	.....	.....	.....	F.	F.
		W....	+ 6.3235	—3.3	.....	.....	.....	.....	.....	F.	F.
		Mean.	+ 6.3202								
T. B. M. 167.....	180.85	E.....	+ 6.7413	+7.2	1.1	.....	296.4755	.....	.....	F.	J.
		W....	+ 6.7462	+2.3	.....	.....	.....	.....	.....	F.	J.
		E.....	+ 6.7496	—1.1	.....	.....	.....	.....	.....	F.	J.
		W....	+ 6.7527	—4.2	.....	.....	.....	.....	.....	F.	J.
		E.....	+ 6.7512	—2.7	.....	.....	.....	.....	.....	F.	J.
		W....	+ 6.7501	—1.6	.....	.....	.....	.....	.....	F.	J.
		Mean.	+ 6.7485								
T. B. M. 168 and 168 *a*.	181.85	E.....	+ 6.6583	+3.5	1.4	.....	303.1373	.....	.....	F.	J.
		W....	+ 6.6605	+1.3	.....	.....	.....	.....	.....	F.	J.
		E.....	+ 6.6676	—5.8	.....	.....	.....	.....	.....	F.	J.
		W....	+ 6.6609	+0.9	.....	.....	.....	.....	.....	F.	J.
		Mean.	+ 6.6618								

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	*r*	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
T. B. M. 170 and 170 *a*.	183. 90	E.....	—13. 5610	+3. 9	2. 6	.....	289. 5802	.....	.....	F.	F.
		W	—13. 5532	—3. 9	.....	.....	.....	.....	.....	F.	F.
		Mean .	—13. 5571								
T. B. M. 171 and 171 *a*.	185. 17	E.....	— 2. 3114	—1. 7	1. 1	.....	287. 2671	.....	.....	F.	F.
		W	— 2. 3148	+1. 7	.....	.....	.....	.....	.....	F.	F.
		Mean .	— 2. 3131								
T. B. M. 172 and 172 *a*.	186. 42	E.....	— 2. 3612	—0. 9	0. 6	.....	284. 9050	.....	.....	F.	F.
		W	— 2. 3630	+0. 9	.....	.....	.....	.....	.....	F.	F.
		Mean .	— 2. 3621								
T. B. M. 173 and 173 *a*	187. 90	E.....	+ 1. 2512	+1. 0	0. 7	.....	286. 1572	.....	.....	F.	J.
		W	+ 1. 2533	—1. 1	.....	.....	.....	.....	.....	F.	J.
		Mean .	+ 1. 2522								
T. B. M. 174 and 174 *a*.	188. 56	E.....	— 1. 6820	—0. 8	0. 5	.....	284. 4744	.....	.....	F.	J.
		W	— 1. 6835	+0. 7	.....	.....	.....	.....	.....	F.	J.
		Mean .	— 1. 6828								
*U. S. P. B. M. 84, Pingree Grove.	.....	.....	+ 1. 3312	+1. 2	0. 8	11. 6	285. 8068	+2. 8	285. 8096	F.	F.
		.....	+ 1. 3335	—1. 1	.....	.....	.....	.....	.....	F.	J.
		Mean .	+ 1. 3324								
T. B. M. 175, Pingree Grove.	189. 91	E.....	— 0. 7512	—0. 6	0. 4	.....	283. 7226	.....	.....	F.	J.
		W	— 0. 7523	+0. 5	.....	.....	.....	.....	.....	F.	J.
		Mean .	— 0. 7518								
T. B. M. 177 and 177 *a*.	192. 38	E.....	— 4. 7112	+0. 2	0. 1	.....	279. 0116	.....	.....	F.	F.
		W	— 4. 7109	—0. 1	.....	.....	.....	.....	.....	F.	F.
		Mean .	— 4. 7110								
T. B. M. 178 and 178 *a*.	193. 38	E	—7. 4809	—3. 9	1. 1	.....	271. 5268	.....	.....	F.	F.
		W	—7. 4887	+3. 9	.....	.....	.....	.....	.....	F.	F.
		E.....	—7. 4840	—0. 8	.....	.....	.....	.....	.....	F.	F.
		W	—7. 4854	+0. 6	.....	.....	.....	.....	.....	F.	F.
		Mean .	—7. 4848								
T. B. M. 179.....	193. 85	E.....	—0. 3108	+1. 0	0. 6	.....	271. 2170	.....	.....	F.	J.
		W	—0. 3089	—0. 9	.....	.....	.....	.....	.....	F.	J.
		Mean .	—0. 3098								
*U. S. P. B. M. 85, W. of Dumpser.	.....	.....	—5. 8630	+0. 2	0. 1	11. 7	265. 3542	+2. 2	265. 3564	F.	F.
			—5. 8627	—0. 1	.....	.....	.....	.....	.....	F.	F.
			—5. 8628								
T. B. M. 180 and 180 *a*.	194. 36	E.....	—3. 7933	+1. 3	0. 9	.....	267. 4250	.....	.....	F.	J.
		W	—3. 7906	—1. 4	.....	.....	.....	.....	.....	F.	J.
		Mean .	—3. 7920								
T. B. M. 181 and 181 *a*.	195. 35	E.....	—7. 6927	+0. 6	0. 4	.....	259. 7329	.....	.....	F.	J.
		W	—7. 6916	—0. 5	.....	.....	.....	.....	.....	F.	J.
		Mean .	—7. 6921								
T. B. M. 182 and 182 *a*.	195. 96	E.....	—3. 3117	+6. 0	1. 4	.....	256. 4272	.....	.....	F.	J.
		W	—3. 3045	—1. 2	.....	.....	.....	.....	.....	F.	J.
		E	—3. 3043	—1. 4	.....	.....	.....	.....	.....	F.	J.
		W	—3. 3023	—3. 4	.....	.....	.....	.....	.....	F.	J.
		Mean .	—3. 3057								

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	*r*	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
T. B. M. 183 and 183 *a*.	197.06	E.....	—3.1127	+0.5	0.3	.....	253.3150	.....	.....	F.	J.
		W	—3.1117	—0.5	.....	.....	.....	.....	.....	F.	J.
		Mean .	—3.1122								
T. B. M. 185 and 185 *a*.	199.20	E.....	—15.1930	—2.9	1.9	.....	238.1191	.....	.....	F.	F.
		W	—15.1988	+2.9	.....	.....	.....	.....	.....	F.	F.
		Mean .	—15.1959								
T. B. M. 186 and 186 *a*.	201.02	E.....	—14.3749	+0.9	0.6	.....	223.7451	.....	.....	F.	F.
		W	—14.3732	—0.8	.....	.....	.....	.....	.....	F.	F.
		Mean	—14.3740								
*U. S. P. B. M. 86 W., Elgin, Ills.	.....	.....	+1.0002	.....	.....	12.0	224.7453	+1.0	224.7463	....	J.
*U. S. P. B. M. 87 W., Elgin, Ills.	.....	.....	+0.3800	—0.2	0.1	12.0	224.1249	+1.0	224.1259	F.	J.
			+0.3796	+0.2	.....	.....	.....	.....	.....	F.	J.
		Mean .	+0.3798								
*B. M. (for Mr. Newcombs) at Elgin, Ill.	.....	.....	+9.2756	.....	.....	.....	233.4005	+1.3	233.4018	....	...
*Base of Rail C. M. & St. P. R. R., Bridge Street crossing.	.....	.....	—0.3540	.....	.....	.....	223.7709	.....	.....	....	J.
T. B. M. 188 and 188 *a*.	202.77	E.....	—1.0236	—1.0	0.6	.....	224.7677	.....	.....	F.	J.
		W	+1.0217	+0.9	.....	.....	.....	.....	.....	F.	J.
		Mean .	+1.0226								
T. B. M. 189 and 189 *a*.	203.28	E.....	+1.3120	—0.9	0.6	.....	226.0788	.....	.....	F.	J.
		W	+1.3102	+0.9	.....	.....	.....	.....	.....	F.	J.
		Mean .	+1.3111								
*U. S. P. B. M. 88 Bridge, Fox River.	.....	.....	—0.0010	—0.1	0.1	12.0	226.0777	+1.1	226.0788	F.	J.
			—0.0012	+0.1	.....	.....	.....	.....	.....	F.	J.
		Mean .	—0.0011								
T. B. M. 191 and 191 *a*.	204.65	E.....	+2.3007	+0.2	0.1	.....	228.3797	.....	.....	F.	J.
		W	+2.3011	—0.2	.....	.....	.....	.....	.....	F.	J.
		Mean .	+2.3009								
T. B. M. 193 and 193 *a*.	206.83	E.....	+13.1758	—0.8	0.5	.....	241.5547	.....	.....	F.	F.
		W	+13.1742	+0.8	.....	.....	.....	.....	.....	F.	F.
		Mean .	+13.1750								
T. B. M. 194 and 194 *a*.	208.46	E....	+0.2088	—2.0	1.3	.....	241.7615	.....	.....	F.	F.
		W	+0.2049	+1.9	.....	.....	.....	.....	.....	F.	F.
		Mean .	+0.2068								
T. B. M. 195 and 195 *a*.	210.25	E.....	+7.8912	—2.2	1.4	.....	249.6505	.....	.....	F.	J.
		W	+7.8869	+2.1	.....	.....	.....	.....	.....	F.	J.
		Mean .	+7.8890								
T. B. M. 196 and 196 *a*.	211.53	E.....	+0.6321	—0.5	0.3	.....	250.2821	.....	.....	F.	J.
		W	+6.6311	+0.5	.....	.....	.....	.....	.....	F.	J.
		Mean .	+0.6316								
*U. S. P. B. M. 89, Bartlett, Ill.	.....	.....	+0.8485	0.0	.....	12.2	251.1306	+1.8	251.1324	F.	J.
			+0.8485	0.0	.....	.....	.....	.....	.....	F.	F.
		Mean .	+0.8485								

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	*r*	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
T. B. M. 197 and 197 *a*.	213.30	E.....	+0.2547	—1.7	1.1	.....	250.5351	.....	.....	F.	F.
		W	+0.2513	+1.7	.....	.....	.....	.....	.....	F.	F.
		Mean .	+0.2530								
T. B. M. 198 and 198 *a*.	214.34	E.....	+3.2780	+1.3	0.9	.....	253.8144	.....	.....	F.	F.
		W	+3.2807	—1.4	.....	.....	.....	.....	.....	F.	F.
		Mean .	+3.2793								
T. B. M. 199 and 199 *a*.	215.10	E.....	—3.2312	—1.1	0.9	.....	250.5821	.....	.....	F.	J.
		W	—3.2363	+4.0	.....	.....	.....	.....	.....	F.	J.
		E.....	—3.2310	—1.3	.....	.....	.....	.....	.....	F.	J.
		W	—3.2309	—1.4	.....	.....	.....	.....	.....	F.	J.
		Mean .	—3.2323								
T. B. M. 200.....	215.82	E.....	—2.8273	+1.4	0.9	.....	247.7562	.....	.....	F.	F.
		W	—2.8245	—1.4	.....	.....	.....	.....	.....	F.	J.
		Mean .	—2.8259								
T. B. M. 201 and 201 *a*.	217.03	E.....	+2.6177	—4.5	1.1	250.3	694	.....	.....	F.	F.
		W	+2.6120	+1.2	.....	.....	.....	.....	.....	F.	F.
		E.....	+2.6102	+4.0	.....	.....	.....	.....	.....	F.	F.
		W	+2.6129	+0.3	.....	.....	.....	.....	.....	F.	F.
		Mean .	+2.6132								
T. B. M. 203 and 203 *a*.	218.62	E.....	—1.6997	+1.9	1.3	1.3	248.6716	.....	.....	F.	J.
		W	—1.6958	—2.0	.....	.....	.....	.....	.....	F.	J.
		Mean .	—2.6132								
T. B M. 204 and 204 *a*.	220.53	E.....	— 7.5520	—0.3	0.2	.....	241.1193	.....	.....	F.	J.
		W	— 7.5525	+0.2	.....	.....	.....	.....	.....	F.	J.
		Mean .	— 7.5523								
*U. S. P. B. M. 90 at Roselle, Ill.	.....	.....	+ 0.2886	0.0	0.0	12.4	241.4079	+1.5	241.4094	F.	F.
			+ 0.2885	+0.1	.....	.....	.....	.....	.....	F.	F.
		Mean .	+ 0.2886								
T. B. M. 206 and 206 *a*.	222.63	E.....	— 7.8993	—0.9	0.6	.....	233.2191	.....	.....	F.	F.
		W	— 7.9012	+1.0	.....	.....	.....	.....	.....	F.	F.
		Mean	— 7.9002								
T. B. M. 207 and 207 *a*.	223.66	E.....	— 3.8302	+2.3	1.5	.....	229.3912	.....	.....	F.	J.
		W	— 3.8256	—2.3	.....	.....	.....	.....	.....	.....	.....
		Mean .	— 3.8279								
T B. M. 208 and 208 *a*.	224.65	E.....	— 0.7305	—0.3	0.2	.....	228.6604	.....	.....	F.	F.
		W	— 0.7311	+0.3	.....	.....	.....	.....	.....	F.	F.
		Mean .	— 0.7308								
T. B. M. 209 and 209 *a*.	226.30	E.....	—12.6975	—1.1	0.7	.....	215.9618	.....	.....	F.	F.
		W	—12.6996	+1.0	.....	.....	.....	.....	.....	F.	F.
		Mean .	—12.6986								
*U. S. P. B. M. 91 at Itasca.	.....	.....	+ 3.1812	—0.3	0.2	12.6	219.1427	+0.9	219.1436	F.	F.
			+ 3.1806	+0.3	.....	.....	.....	.....	.....	F.	F.
		Mean .	+ 3.1809								
T. B. M. 210 and 210 *a*.	227.22	E.....	— 2.2257	+2.8	1.0	.....	213.7389	.....	.....	F.	A.
		W	— 2.2207	—2.2	.....	.....	.....	.....	.....	F.	A.
		E.....	— 2.2224	—0.5	.....	.....	.....	.....	.....	F.	J.
		Mean .	— 2.2229								

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	*r*	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
T. B. M. 211 and 211 *a*.	228.14	E.....	+ 0.9483	+0.3	0.2	.....	214,6875	.....	.....	F.	F.
		W	+ 0.9489	—0.3	.....	.....	.....	.....	.....	F.	F.
		Mean .	+ 0.9486								
T. B. M. 212 and 212 *a*.	229.26	E.....	+ 1.5918	—0.5	0.3	.....	216.2788	.....	.....	F.	F.
		W	+ 1.5908	+0.5	.....	.....	.....	.....	.....	F.	F.
		Mean .	+ 1.5913								
T. B. M. 213 and 213 *a*.	230.89	E.....	— 0.1205	—1.2	0.8	.....	216.1571	.....	.....	F.	J.
		W	— 0.1228	+1.1	.....	.....	.....	.....	.....	F.	J.
		Mean .	— 0.1217								
T. B. M. 214.....	231.57	E.....	— 4.3865	+3.2	2.1	.....	211.7738	.....	.....	F.	J.
		W	— 4.3824	—0.9	.....	.....	.....	.....	.....	F.	J.
		E.....	— 4.3827	—0.6	.....	.....	.....	.....	.....	F.	J.
		W	— 4.3816	—1.7	.....	.....	.....	.....	.....	F.	F.
		Mean .	— 4.3833								
T. B. M. 215 and 215 *a*.	232.41	E.....	+ 0.8893	+1.0	0.7	.....	212.6641	.....	.....	F.	J.
		W	+ 0.8913	—1.0	.....	.....	.....	.....	.....	.....	...
		Mean .	+ 0.8903								
*U. S. P. B. M. 92 at Bensenville, Ill.	.....	.....	+ 1.0094	0.0	0.0	12.8	213.6735	+0.7	213.6742	F.	J.
			+ 1.0093	+0.1	.....	.....	.....	.....	.....	F.	F.
		Mean .	+ 1.0094								
T. B. M. 216 and 216 *a*	234.08	E.....	—4.7136	—0.5	0.4	.....	207.9500	.....	.....	F.	F.
		W	—4.7146	+0.6	.....	.....	.....	.....	.....	F.	F.
		Mean .	—4.7141								
T. B. M. 218 and 218 *a*	235.83	E.....	—4.2274	—1.5	1.0	.....	203.7211	.....	.....	F.	F.
		W	—4.2305	+1.6	.....	.....	.....	.....	.....	F.	F.
		Mean .	—4.2289								
T. B. M. 219 and 219 *a*	237.64	E.....	—0.7478	—1.6	1.1	.....	202.9717	.....	.....	F.	J.
		W	—0.7510	+1.6	....	.....	.....	.....	.....	.....	...
		Mean .	—0.7494								
* U. S. P. B. M. 93, at Manheim, Ill.	.....	.....	+1.5343	+0.4	0.2	12.9	204.5064	+0.5	204.5069	F.	J.
			+1.5350	—0.3	.....	.....	.....	.....	.....	F.	F.
		Mean .	+1.5347								
T. B. M. 220 and 220 *a*	238.59	E.....	—0.9666	—0.7	0.5	.....	202.0044	.....	.....	F.	J.
		W	—0.9681	+0.8	.....	.....	.....	.....	.....	.....	...
		Mean .	—0.9673								
T. B. M. 221 and 221 *a*	239.42	E.....	—0.6870	—0.9	0.6	.....	201.3165	.....	.....	F.	F.
		W	—0.6888	+0.9	.....	.....	.....	.....	.....	F.	F.
		Mean .	—0.6879								
T. B. M. 223 and 223 *a*	241.96	E.....	—3.2529	—2.3	1.6	.....	198.0613	.....	.....	F.	F.
		W	—3.2576	+2.4	.....	.....	.....	.....	.....	F.	F.
		Mean .	—3.2552								
T. B. M. 225 and 225 *a*	244.05	E.....	+4.2453	+2.6	1.8	.....	202.3092	.....	.....	F.	J.
		W	+4.2506	—2.7	.....	.....	.....	.....	.....	F.	J.
		Mean .	+4.2479								

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	r	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
T. B. M. 226 and 226 *a*	245.35	E.....	+2.3476	+0.6	0.4	.....	204.6574	.....	.....	F.	F.
		W	+2.3488	−0.6	.....	.....	.....	.....	.....	F.	F.
		Mean	+2.3482								
T. B. M. 227 and 227 *a*	246.32	E.....	−1.5306	+0.2	0.2	.....	203.1270	.....	.....	F.	F.
		W	−1.5301	−0.3	.....	.....	.....	.....	.....	F.	F.
		Mean .	−1.5304								
T. B. M. 229 and 229 *a*	248.38	E.....	−8.7232	+1.6	1.0	.....	194.4054	.....	.....	F.	F.
		W	−8.7201	−1.5	.....	.....	.....	.....	.....	F.	F.
		Mean .	−8.7216								
T. B. M. 230 and 230 *a*	249.10	E.....	−1.2603	+2.1	0.6	.....	193.1472	.....	.....	F.	F.
		W	−1.2560	−2.2	.....	.....	.....	.....	.....	F.	F.
		E.....	−1.2590	+0.8	.....	.....	.....	.....	.....	F.	F.
		W	−1.2575	−0.7	.....	.....	.....	.....	.....	F.	F.
		Mean .	−1.2582								
*U. S. P. B. M. 94, at Cragin.	.....	.....	+1.2989	−0.2	0.1	13.2	194.4459	+0.2	194.4461	F.	F.
			+1.2985	+0.2	.....	.....	.....	.....	.....	F.	F.
		Mean .	+1.2987								
T. B. M. 231 and 231 *a*	250.06	E.....	−1.6839	+0.7	0.4	.....	191.4640	.....	.....	F.	F.
		W	−1.6826	−0.6	.....	.....	.....	.....	.....	F.	F.
		Mean .	−1.6832								
T. B. M. 232 and 232 *a*	251.31	E.....	−0.9968	−1.4	0.9	.....	190.4658	.....	.....	F.	F.
		W	−0.9996	−1.4	.....	.....	.....	.....	.....	...	...
		Mean .	−0.9982								
T. B. M. 233 and 233 *a*	252.50	E.....	−1.3649	−2.5	1.7	.....	189.0984	.....	.....	F.	J.
		W	−1.3699	+2.5	.....	.....	.....	.....	.....	F.	J.
		Mean .	−1.3674								
T. B. M. 234 and 334 *a*	254.27	E.....	−1.4166	+2.6	1.6	.....	187.6844	.....	.....	F.	J.
		W	−1.4081	−5.9	.....	.....	.....	.....	.....	F.	J.
		E.....	−1.4126	−1.4	.....	.....	.....	.....	.....	F.	J.
		W	−1.4185	+4.5	.....	.....	.....	.....	.....	F.	J.
		Mean .	−1.4140								
T. B. M. 236 and 236 *a*	256.11	E.....	−2.3264	+0.6	0.4	.....	185.3586	.....	.....	F.	F.
		W	−2.3252	−0.6	.....	.....	.....	.....	.....	F.	F.
		Mean .	−2.3258								
*U. S. P. B. M. 95 at Chicago.	.....		+1.0850	0.0	0.0	13.5	186.4436	−0.1	186.4435	F.	F.
			+1.0849	+0.1	.....	.....	.....	.....	.....	F.	F.
		Mean .	+1.0850								
T. B. M. 237 and 237 *a*	257.77	E.....	−0.2334	+1.0	0.7	.....	185.1262	.....	.....	F.	F.
		W	−0.2314	−1.0	.....	.....	.....	.....	.....	F.	F.
		Mean .	−0.2324								
*Chicago	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	...
City B. M. I	.....	.....	+2.4761	.....	.....	13.5	187.6023	0.0	187.6023	F.	F.
T. B. M. 238.....	258.57	E.....	+0.3873	−0.7	0.4	.....	185.5128	.....	.....	F.	F.
		W	+0.3860	+0.6	.....	.....	.....	.....	.....	F.	F.
		Mean .	+0.3866								

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	*r*	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
*Chicago	.....	.....	+1.6024	−0.4	0.3	13.5	187.1148	0.0	187.1148	....	F.
City B. M. II	.....	.....	+1.6016	+0.4	.....	.....	.....	.....	.....	....	F.
		Mean	+1.6020								
T. B. M. 239 and 239 *a*	258.97	E	−0.1588	−0.7	0.5	.....	185.3533	.....	.....	F.	F.
		W	−0.1602	+0.7	.....	.....	.....	.....	.....	F.	F.
		Mean	−0.1595								
*Chicago	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	...
City B. M. IV	259.63	E	+1.6798	+2.4	1.0	13.5	187.0355	0.0	187.0355	F.	J.
		W	+1.6862	−4.0	.....	.....	.....	.....	.....	F.	J.
		E	+1.6823	−0.1	.....	.....	.....	.....	.....	F.	J.
		W	+1.6806	+1.6	.....	.....	.....	.....	.....	F.	J.
		Mean	+1.6822								
*Chicago	.....	E	−1.1830	+0.2	0.1	13.5	185.8527	−0.1	185.8526	F.	J.
City B. M. III		W	−1.1827	−0.1	.....	.....	.....	.....	.....	F.	J.
		Mean	−1.1828								
*Zero of Chicago ave.	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	...
River gauge	.....	.....	−3.0260	.....	.....	13.5	182.8267	−0.2	182.8265	F.	J.
*Zero of	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	...
Temporary gauge A	.....	.....	−3.0595	.....	.....	13.5	182.7932	−0.2	182.7930	F.	J.
T. B. M. 240	260.46	E	+0.1820	−1.2	0.8	.....	187.2163	.....	.....	F.	F.
		W	+0.1797	+1.1	.....	.....	.....	.....	.....	F.	J.
		Mean	+0.1808								
*Chicago City B. M. VI.	.....	.....	+0.2785	−0.1	0.1	13.6	187.4947	0.0	187.4947	....	F.
			+0.2783	+0.1	.....	.....	.....	.....	.....	....	F.
		Mean	+0.2784								
*U. S. P. B. M. 96, at Chicago.	.....	.....	+1.2215	+0.1	0.0	13.6	188.4379	0.0	188.4379	....	F.
			+1.2216	0.0	.....	.....	.....	.....	.....	....	F.
		Mean	+1.2216								
T. B. M. 241	260.88	E	−0.3157	−1.1	0.7	.....	186.8995	.....	.....	F.	F.
		W	−0.3178	+1.0	.....	.....	.....	.....	.....	F.	J.
		Mean	−0.3168								
Chicago City B. M. IX.	261.20	E	+0.0580	−0.8	0.6	13.6	186.9567	0.0	182.9567	F.	F.
		W	+0.0563	+0.9	.....	.....	.....	.....	.....	F.	J.
		Mean	+0.0572								
*U. S. P. B. M. 97, at Chicago.	.....	.....	+0.7092	+0.2	0.2	13.6	187.6661	0.0	187.6661	F.	F.
			+0.7097	−0.3	.....	.....	.....	.....	.....	F.	F.
		Mean	+0.7094								
*U. S. P. B. M. 98, at Chicago.	.....	.....	+1.5330	−0.1	0.1	13.6	188.4896	0.0	188.4896	F.	F.
			+1.5328	+0.1	.....	.....	.....	.....	.....	F.	F.
		Mean	+1.5329								
*Chicago City B. M. VIII.	.....	.....	−0.1007	−0.1	0.1	13.6	186.8559	0.0	186.8559	F.	F.
			−0.1010	+0.2	.....	.....	.....	.....	.....	F.	F.
		Mean	−0.1008								
Zero of temporary gauge "B."	261.36	E	−3.9299	−0.1	0.1	13.6	183.0267	−0.2	183.0265	F.	F.
		W	−3.9302	+0.2	.....	.....	.....	.....	.....	....	...
		Mean	−3.9300								

Results of precise leveling, Fulton to Chicago, Ill.—Continued.

Bench.	Distance.	Direction.	Difference of elevation.	V	*r*	R	Elevation.	Rod correction.	Corrected elevation.	Supports.	Observer.
	Km.		*M.*	*Mm.*	*Mm.*	*Mm.*	*M.*	*Mm.*	*M.*		
*Chicago City B. M. VII.	.....	.....	+0.7220	+0.2	0.1	13.6	187.6217	0.0	187.6217	F.	F.
			+0.7223	−0.1	.....	.....	.....	.....	.....	F.	F.
		Mean.	+0.7222								
*U. S. P. B. M. 99, at Chicago.	.....	.....	−1.2548	+0.5	0.3	13.6	186.3674	−0.1	186.3673	F.	F.
			−1.2538	−0.5	.....	.....	.....	.....	.....	F.	J.
		Mean.	−1.2543								
*T. B. M. 242	.....	.....	−3.0020	+0.6	0.4	13.6	184.6203	.....	.....	F.	F.
			−3.0008	−0.6	.....	.....	.....	.....	.....	F.	J.
		Mean.	−3.0014								
*Zero of temporary gauge "C."	.....	.....	−4.5045	+1.4	0.9	13.6	183.1186	−0.2	183.1184	F.	F.
			−4.5017	−1.4	.....	.....	.....	.....	.....	F.	J.
		Mean.	−4.5031								
*Zero of U. S. E. self-registering gauge at Harbor Improvement Office.	.....	.....	−4.5037	+0.9	0.6	13.6	183.1189	−0.2	183.1187	F.	F.
			−4.5017	−0.9	.....	.....	.....	.....	.....	F.	J.
		Mean.	−4.5028								
*T. B. M. 243	.....	E.....	−0.3055	+1.4	0.5	13.6	184.3162	.....	.....	F.	F.
		W....	−0.3040	−0.1	.....	.....	.....	.....	.....	F.	F.
		E.....	−0.3027	−1.4	.....	.....	.....	.....	.....	F.	J.
		Mean.	−0.3041								
*U. S. E. XIII on light-house.	.....	.....	+1.3220	−3.6	2.4	13.8	185.6346	−0.1	185.6345	....	F.
			+1.3148	+3.6	.....	.....	.....	.....	.....	....	J.
		Mean.	+1.3184								
*U. S. E. XI on breakwater.	.....	.....	+0.9593	−5.7	3.8	14.1	185.2798	−0.1	185.2797	....	F.
			+0.9579	+5.7	.....	.....	.....	.....	.....	....	J.
		Mean.	+0.9636								
*U. S. E. XII on breakwater.	.....	.....	+1.1437	−5.9	4.0	14.2	185.4540	−0.1	185.4539	....	F.
			+1.1318	+6.0	.....	.....	.....	.....	.....	....	J.
		Mean.	+1.1378								
Zero of outer crib gauge (temporary).	.....	.....	.....	.....	.....	0.3	182.8287	0.0	.....	....	...
Zero of well or crib gauge.	.....	.....	+2.4380	−0.2	.....	0.1	185.2665	−0.1	186.2664	....	J.
			+2.4378	+0.1	.....	.....	.....	.....	.....	....	...
		Mean.	+2.4378								
City directrix	.....	.....	−2.4414	.....	.....	.....	182.8251	−0.1	182.8250	....	J.
U. S. P. B. M. 100	.....	.....	+2.4461	.....	.....	.....	185.2712	−0.1	185.2712	....	J.

DESCRIPTION OF PERMANENT BENCH-MARKS BETWEEN FULTON AND CHICAGO, ILL.

(All permanent bench-marks are lettered U. S. P. B. M. For description of U. S. P. B. M's 53, 54, 55, and 56, see Annual Report for 1883, page 141.)

U. S. P. B. M. 57 is at Fulton, Whitesides County, Illinois, on the northeast corner of Cherry and Bench streets. It is center mark of copper bolt leaded horizontally in south face of stone foundation wall to the Northern Illinois College, 3½ feet above the ground, and 14 inches from the southwest corner of foundation. Elevation, 188^{m}.1876.

U. S. P. B. M. 58 is in Whitesides County, Illinois, on the southeast abutment of the railroad bridge north of Fulton Junction, 970 meters north from crossing of C., M. and St. P. and the C. and N. W. R. R., first being the top of a copper bolt leaded vertically in the bridge-seat stone. Elevation, 183^{m}.7503.

B. M. 35, of Captain Mackenzie, at Fulton, on water table, southeast corner of engine-room of elevator, under planking. Elevation, 184^{m}.7790.

U. S. P. B. M. 59, three miles north of Fulton Junction, in Whitesides County, Illinois, in west end of north abutment of railroad bridge, being the top of copper bolt leaded vertically in second course of stone from top. Elevation, 185^{m}.8275.

U. S. P. B. M. 65, at Thomson, Carroll County, Illinois, west end of Christian church, 250 meters east of C., M. and St. P. R. R., being the center mark of copper bolt leaded horizontally in the foundation wall. Elevation, 190^{m}.8597.

U. S. P. B. M. 61, one mile south of Savanna, Carroll County, Illinois, in middle pier and directly under railroad bridge No. E 392, being top of copper bolt leaded vertically. Elevation, 185^{m}.0035.

U. S. P. B. M. 62, at Savanna, Carroll County, Illinois, on door-sill of engine-room of the C., M. and St. P. R. R. Co.'s elevator on the bank of the river, being top of copper bolt leaded vertically in the south end of the south door east side. Elevation, 186^{m}.5778.

Captain Mackenzie's B. M. 34 is on the same sill marked "+." Elevation, 186^{m}.5788.

U S. P. B. M. 63, at Savanna, Carroll County, Illinois, on northwest corner of Main and Jefferson streets, in facing stone, south face, southeast corner of brick building owned by W. B. Laws, being the center of copper bolt leaded horizontally. Elevation, 188^{m}.8537.

U. S. P. B. M. 64, Savanna, Carroll County, Illinois, 2½ miles east of the "Junction House," and 50 meters south of the main line of the C., M. and St. P. R. R., in the top of west end of north abutment of wagon bridge over Plum River, being the top of copper bolt leaded vertically. Elevation, 187^{m}.0846.

U. S. P. B. M. 65, 300 meters north of "1 mile post," west of Hickory Grove Station, C., M. and St. P. R. R., Carroll County, Illinois, in east side of stone foundation wall of barn owned by J. Fish, being the center mark of copper bolt leaded horizontally, 5 feet south of door and 3 feet above ground. Elevation, 211^{m}.5027.

U. S. P. B. M. 66, at Mount Carroll, Carroll County, Illinois, about 100 meters south of depot and 4 meters east of C., M. & St. P. R. R., in barn building attached to elevator, being the center mark of copper bolt leaded horizontally in the west end of south face of stone foundation, 3 feet above the ground. Elevation, 225^{m}.1128.

U. S. P. B. M. 67, about 4 miles west of Lanark, Carroll County, Illinois, north end of east abutment of railroad bridge No. 454 (C., M. and St. P. R. R.), over Carroll Creek, being the top of copper bolt leaded vertically in the second course of stone from the top. In the stone are cut the letters "U. S. P. B. M.," and the date, "May 25, 1883." Elevation, 246^{m}.5122.

U. S. P. B. M. 68, at Lanark, Carroll County, Illinois, 25 feet from the southwest corner of Carroll and Main streets on the upper doorstep of brick building occupied by a bank and owned by Walff Bros., being the top of copper bolt leaded vertically in upper doorstep on Carroll street, and 1½ feet above ground. Elevation, 275^{m}.2841.

U. S. P. B. M. 69, is 2¼ miles east of Lanark, Carroll County, Illinois, on the line of the C., M. and St. P. R. R., in coping of north end of east abutment of railroad bridge over Carroll Creek, being the top of a copper bolt leaded vertically. Elevation, 262^{m}.1845.

U. S. P. B. M. 70 is 3½ meters east of Lanark Junction, Carroll County, Illinois, on the line of the C., M. & St. P. R. R., 140 meters south of the track, in barn building owned by Mr. M. Crabtree, being the center mark of copper bolt leaded horizontally in the east end of the north face of stone foundation wall, 2 feet above the ground. Elevation, 294^{m}.8395.

U. S. P. B. M. 71, at Foreston Junction, Ogle County, Illinois, where the C., M. & St. P. R. R. passes under the Illinois Central, in the lower step of west wing of south abutment of the stone archway in the fourth course of stone from the bottom, being the top of a copper bolt leaded vertically. Elevation, 273^{m}.3979.

U. S. P. B. M. 72, at Adeline Station, C., M. & St. P. R. R., Ogle County, Illinois, in elevator building of the aforesaid railroad company, being the center mark of copper bolt leaded horizontally in the east face of stone foundation wall at the southeast corner, about 4 feet above the ground. Elevation, 234^{m}.9307.

U. S. P. B. M. 73, at Leaf River, Ogle County, Illinois, 70 meters east of the depot and just opposite the water-tank, in elevator building owned by D. Sprecker, being the center mark of copper bolt leaded horizontally in the east end of south face of the stone foundation wall about 4 feet above the ground. Elevation, 222^{m}.1946.

U. S. P. B. M. 74, at Byron, Ogle County, Illinois, 560 meters south of the C., M. & St. P. R. R. track measured on Walnut street, in brick and stone building fronting on said street, and occupied by hardware and dry-goods stores, and the Commercial Hotel, owned by J. F. Spalding, being center mark in copper bolt leaded horizontally in north wall of northeast corner, 11 inches from corner and 4 feet above ground. Elevation, 228^{m}.3943.

U. S. P. B. M. 75 is 1¼ miles east of Byron, Ogle County, Illinois, on the line of the C., M. & St. P. R. R. track, in west abutment of railroad bridge over Rock River, being

the top of copper bolt leaded vertically in stone coping south side. Elevation, 217m.-4148.

U. S. P. B. M. 76, at Stillman Valley, Ogle County, Illinois, 50 meters east of the depot and 20 miles south of the main track of the C., M. & St. P. R. R. Co., in the west front of foundation wall of the elevator building owned by J. D. & J. J. White, being the center mark of copper bolt leaded horizontally, 11 inches from the northwest corner. Elevation. 221m.5094.

U. S. P. B. M. 77 is 2,600 meters west of Davis Junction, all in Ogle County, Illinois, in north end of west abutment of small bridge of the C., M. & St. P. R. R., being the top of a copper bolt leaded vertically in the coping stone. Elevation, 252m.5154.

U. S. P. B. M. 78, at Monroe, Ogle County, Illinois, 24 meters west of depot of the C., M. & St. P. R. R., in east face of stone foundation wall of elevator building, owned by D. A. Cipperly, being the center mark of copper bolt leaded horizontally, 1½ feet north of southeast corner and 3½ feet above the ground. Elevation, 262m.9918.

U. S. P. B. M. 79 at Fielding, De Kalb County, Illinois, 10 meters north of main track of the C., M. & St. P. R. R., in south face of stone foundation wall of elevator, being center mark of copper bolt leaded horizontally, 25 feet west of the southeast corner and 2½ feet above the ground. Elevation, 245.m6169.

U. S. P. B. M. 80, at Kirkland, De Kalb County, Illinois, 175 meters south of railroad track, on street running to depot from the south, in brick building owned by Dean & Rowen, to be used when completed for a bank, being the center of a copper bolt leaded horizontally, 6 inches from the northwest corner, on the west face of stone foundation 5 feet above the ground. Elevation, 242m.2161.

U. S. P. B. M. 81, at Kingston, De Kalb County, Illinois, ½ mile east of the depot and 10 meters north of the main track, in a brick store building in Chapman's addition belonging to Mr. Julius Chapman, being center mark in copper bolt leaded horizontally in the water table on west face, northwest corner. Elevation, 251m.4097.

U. S. P. B. M. 82, at Genoa, De Kalb County, Illinois, 100 meters south of main track of the C., M. & St. P. R. R., at the corner of Main and Emmett streets in brick store building owned by Alexander Crawford, being the top of a copper bolt leaded vertically in the south end of stone door sill on the east side. Elevation, 261m.6864.

U. S. P. B. M. 83, at Hampshire, Kane County, Illinois, on State street, in brick building owned by Phillip Shultz, and used for post-office and drug store, in the stone water table in the west face of the southwest corner, being the center mark of copper bolt leaded horizontally. Elevation, 280m.4797.

U. S. P. B. M., 84 at Pingree Grove, Kane County, Illinois, about 100 meters northeast of depot, in foundation of store building owned by J. B. Schedden, in north face 5 feet from the northwest corner, 1 foot above the ground, being the center mark of a copper bolt leaded horizontally. Elevation, 285m.8096.

U. S. P. B. M. 85 is ¾ of a mile west of Dumser Station, Kane County, Illinois, on the line of the C., M. & St. P. R. R., in railroad culvert No. 19, 20 meters north of railroad track, being the top of a copper bolt leaded vertically in coping stone in east end of north abutment. Elevation, 265m.3564.

U. S. P. B. M. 86, at West Elgin, Kane County, Illinois, corner of State street and Highland avenue, in water table of the large brick building known as the Waverly House, on north face, 6 inches from the northeast corner and 4 feet above the ground, being center mark of a horizontal bolt. Elevation, 224m.7463.

U. S. P. B. M. 87, at West Elgin, Kane County, Illinois, on the southwest corner of River street and the C., M. & St. P. R. R. track, on the north face of brick and stone business building owned by Robert Beckwith, being the top of copper bolt leaded vertically in east end of stone doorstep. Elevation, 224m.1259.

B. M. "Newcomb," at East Elgin, Ill., on Center street, btween Du Page and Chicago streets, being cross (×) cut in west face of brick foundation wall of building owned by the Elgin Scientific Association. Elevation, 233m.4018.

U. S. P. B. M. 88 is 1⅛ miles south of Elgin, Kane County, Illinois, in west end of south abutment of the C., M. & St. P. R. R. bridge over Fox River, being the top of a copper bolt leaded vertically in the coping stone. Elevation, 226m.0788.

U. S. P. B. M. 89, at Bartlett, Cook County, Illinois, 150 meters northwest of depot and 100 meters north of railroad track of the C., M. & St. P. Co., in the stone foundation of the Congregational Church, being the center mark of copper bolt leaded horizontally on the east face of the southeast corner. Elevation, 251m.1324.

U. S. P. B. M. 90, at Roselle, Du Page County, Illinois, on the southeast corner of Chicago street and road crossing it, in the north face of foundation wall of brick business building owned by Mathew Secker, standing about 80 meters north of railroad track, being the center of copper bolt leaded horizontally, 3 feet from the northeast corner and 2 feet above the ground. Elevation, 241m.4094.

U. S. P. B. M. 91, at Itasca, Du Page County, Illinois, 80 meters north of track of the C., M. & St. P. R. R., and in a northeasterly direction from the depot, in the foundation wall of frame store building (east face), owned by Dr. Elijah Smith, being the

center of copper bolt leaded horizontally, 2 feet from the southeast corner. Elevation, 219^{m}.1436.

U. S. P. B. M. 92, at Bensenville, Du Page County, Illinois, 40 meters north of depot, in south side of frame store building, owned by C. A. Franz, being the center of copper bolt leaded horizontally in the stone foundation, one foot west of the southeast corner and 2 feet above ground. Elevation, 213^{m}.6742.

U. S. P. B. M. 93, at Mannheim, Cook County, Illinois, 250 meters northwest of the depot of the C., M. & St. P. R. R., in the south side of the base of the brick chimney at Mr. C. H. Bossenberg's creamery, being the center mark of copper bolt leaded horizontally in the middle of the chimney and 3 feet above the ground. Elevation, 204^{m}.5069.

U. S. P. B. M. 94, at Cragin, Cook County, Illinois, on the northeast corner of Grand and Armitage avenues, about 150 meters north of the line of the C., M. & St. P. R. R., in the east face of foundation wall of Jennings's brick saloon building, being the center mark of copper bolt leaded horizontally, 10 inches from the southeast corner and 4 feet above the ground. Elevation, 194^{m}.4461.

U. S. P. B. M. 95, at Chicago, Ill., on the southeast corner of Dixon street and Bloomingdale road about 20 meters southwest of crossing of the C., M. & St. P., and C. & N. W. R. R., in the west face of brick building known as L. Epps & Co.'s malt house, 6 inches from the northwest corner and 2½ feet above the ground, being the center of a copper bolt leaded horizontally. Elevation, 186^{m}.4435.

U. S. P. B. M. 96, at Chicago, Ill., on the south side of Chicago avenue at Nos. 242 and 244, near Clark street, in police station brick building, in the north face 1 foot west of the northeast corner and 3½ feet above the ground, being the center mark of a copper bolt leaded horizontally. Elevation, 188^{m}.4379.

U. S. P. B. M. 97, at Chicago, Ill., on the northeast corner of Chicago avenue and Pine street, in the east face of the southeast buttress of stone engine-house of the Chicago Water Works, in the stone water-table 18 inches north of the southeast corner and 3 feet above the ground. Elevation, 187^{m}.6661.

U. S. P. B. M. 98, at Chicago, Ill., on the northwest corner of Chicago avenue and Pine street, in middle of the south wall of water tower, in the east end of the south doorsill, 3 feet above the ground, being the top of a copper bolt leaded vertically. Elevation, 188^{m}.4896.

U. S. P. B. M. 99, at Chicago, Ill., in Illinois Central Railroad stone freight depot, situated on Goodrich street docks on the west side of slip A, opposite the Central Elevator, in east face of foundation wall 1 foot south of the northeast corner and 2½ feet above the ground, being the center mark of a copper bolt leaded horizontally. Elevation, 186^{m}.3673.

U. S. P. B. M. 100, in Lake Michigan, on the crib of the Chicago Water Works, on the top of the iron cylinder of shaft of the 5-foot tunnel, nearly of same elevation as the zero of the gauge, on the east side of the top of the shaft, being a cross (×) cut with cold chisel, not lettered.

DESCRIPTIONS AND ELEVATIONS OF CHICAGO CITY BENCH-MARKS.

The city directrix is 8.01 feet below the zero of the crib-gauge, which reads downwards from the top or zero. Elevation, 182^{m}.8250.

B. M. I is top of east end of stone step of private entrance to No. 161 North avenue, on the northwest corner of Halsted street and North avenue. Elevation, 187^{m}.6023.

B. M. II is stone step west corner of brick house No. 153 Division street, being the third lot west of Grace street. Elevation, 187^{m}.1148.

B. M. III, water table of round-house, northeast corner of Halsted and West Chicago avenue, established before "the fire." Elevation, 185^{m}.8526.

B. M. IV, extreme corner of stone sidewalk at the northeast corner of Wesson street and East Chicago avenue. Elevation, 187^{m}.0355.

B. M. VI, east end of coping of iron fence of police station on the south side of Chicago avenue near Clark street. Elevation, 187^{m}.4947.

B. M. VII, on corner of stone water-table northwest corner of tower of St. James Church, at southeast corner of Cass and Huron streets. Elevation, 187^{m}.6217.

B. M. VIII, corner of stone water-table, southeast corner of Chicago Water Works (machine shop), east of Pine street on Chicago avenue. Elevation, 186^{m}.8559.

B. M. IX, north corner of iron frame of manhole to Chicago avenue shaft at Water Works into 7-foot tunnel, said to have been disturbed by grading sidewalk. Elevation, 186^{m}.9567.

DESCRIPTIONS AND ELEVATIONS OF UNITED STATES ENGINEERS, BENCH-MARKS AT CHICAGO, ILL., SET FROM THE CITY BENCH-MARK VII. DESCRIPTIONS TAKEN FROM RECORDS IN THE OFFICE OF MAJOR W. H. H. BENYAURD, CORPS OF ENGINEERS.

B. M. XI, top of spike on United States easterly breakwater in center of long timber and 6 inches south of second cross-tie, counting from inner corner of breakwater. Elevation, 185^{m}.2797.

B. M. XII, top of water-gauge chamber, middle of south wall of box. Same as read in 1876–'79. Elevation, 185^{m}.4539.

B. M. XIII, upper surface of lower horizontal bar (compression member) between the southerly pillars of light-house on the north side of the mouth of Chicago River. Elevation 185^{m}.6345.

DESCRIPTION OF PERMANENT BENCH-MARKS OF COAST AND GEODETIC SURVEY ON MISSISSIPPI RIVER FROM GREENVILLE, MISSISSIPPI, TO CARROLLTON, LOUISIANA.

B. M. 1 is on the corrugated iron door-sill of a brick building in Greenville, known as the bank building. It is said to be one of the oldest brick buildings in town; the Levee Board has its rooms in this building, over the bank. The exact point is near the back side and west end of sill, 320 millimeters from front face, 55 millimeters from door-strip, 90 millimeters from right-hand (west) door jamb. The door is near the northwest corner of building, in north side. The point is not marked. Elevation, 46^{m}.0891.

B. M. 2 is center of head of copper bolt 10 centimeters long and 2 centimeters diameter, leaded horizontally into a brick in the fourteenth tier of bricks above the water-sill of C. B. Huntingdon's gin-house near Greenville, Miss. It is on the side of the chimney facing the river. The gin-house stands about half a mile below the town and as far from the river bank. The chimney is said to be the oldest one erected for its purpose in Washington County. The letters $\frac{U.\ S.}{B.\ M.}$ are cut in the brick, as here shown. Elevation, 46^{m}.5836.

B. M. 11 is top of copper bolt in top of cement post 3 feet long, set with top flush with surface of ground in yard of Mr. Warfield on Highland Plantation, Warfield Point, Washington County, Mississippi. The cement post is north of the house, between the line of the fence and a cottonwood tree about 4 feet in diameter, and is eight feet from the tree. Elevation, 45^{m}.5590.

B. M. 19 is the center of head of a copper bolt about 2 centimeters in diameter leaded horizontally into the brick chimney of the gin-house of Refuge Plantation. The chimney is cylindrical and stands about 1 mile north of Refuge Landing and about $\frac{1}{2}$ mile back from the chute of Island 84. The bolt is about 3 feet above ground. Elevation, 46^{m}.0042.

B. M. 22 is the center of head of a copper bolt about 2 centimeters in diameter leaded into the brick foundation of Mr. Richardson's store at Refuge, Mississippi. The bolt is in the twenty-first tier of bricks above the water sill of the second pier from the levee on the northwest side of the building. Elevation, 45^{m}.7483.

B. M. 33 is the center of head of a copper bolt 2 centimeters in diameter leaded horizontally into the brick foundation on the front side of the dwelling of Wayside Plantation, near the banks of Lake Lee, Washington County, Mississippi. It is in the fourth tier of brick below the wood sill and in the eighth tier above the ground. It is 0^{m}.35 south from the south end of the porch and 0^{m}.64 from the north end of a small ventilator covered with iron grating. Elevation, 43^{m}.1845.

B. M. 39 is the center of head of a copper bolt 2 centimeters in diameter leaded horizontally into the north face of the large brick chimney of gin-house on Buckner's estate, Auburn Plantation, Washington County, Mississippi. The letters U. S. B. M. are cut in the surrounding bricks. The chimney stands about 1.5 kilometers south of the levee running along Lake Lee. Elevation, 42^{m}.3212.

B. M. 42 is the center of head of a copper bolt leaded horizontally into the large brick chimney of gin-house of Glenora Plantation, Washington County, Mississippi. The gin-house stands about a kilometer back of the levee. The letters U. S. B. M. are cut in the surrounding bricks. Elevation, 42^{m}.8024.

B. M. 46 is the center of head of a copper bolt 2 centimeters in diameter leaded horizontally into the west face of the gin-house chimney of Mr. Merit Williams on Longwood Plantation, Washington County, Mississippi. The chimney stands about 270 meters back from the levee and abont 700 meters from the river. The bench-mark is in the middle of the thirteenth brick above water-sill and fourth brick from southwest corner of chimney. Elevation, 42^{m}.7002.

B. M. 56 is the top of a copper bolt 2 centimeters in diameter and 20 centimeters long placed vertically in a cement post set in ground 100 feet east of road leading from Lake Washington Landing to Lake Washington and 53 feet south of levee. It is on the plantation owned by D. M. Hill. Elevation, 42^{m}.0971.

B. M. 62 is the center of head of copper bolt 2 centimeters in diameter and 7 centimeters long, leaded horizontally into the brick underpinning of dwelling house of W. W. Worthington, jr., just back of Levta on the Maryland Plantation, Washington County, Mississippi. The house is about 250 meters from the levee. The bolt is in center of second brick below wood-sill and sixth brick west of small ventilator. Elevation, 42^{m}.7541.

B. M. 65 is center of head of a copper bolt leaded horizontally into a brick in front side of dwelling-house on Albemarle Plantation, Washington County, Mississippi, owned by Mr. H. J. Johnson. It is in the second brick below water-sill, and about the middle of the large brick column on the left-hand side of the entrance to the house. The house is about 1 mile below Leota and about 150 meters from the river. Elevation, $42^{m}.9107$.

B. M. 70 is the center of head of a copper bolt leaded horizontally into the brick pillar at the northwest corner of the dwelling-house on Palmetto Plantation, owned by J. F. Kershaw, in Washington County, Mississippi. Elevation, $40^{m}.9311$.

B. M. 83 is the center of head of a copper bolt leaded horizontally into second brick pillar north from main entrance of dwelling-house owned by Mr. Robert Turnbull, on Riverdale Plantation, in Issaquena County, Mississippi. It is in third tier of bricks below the weatherboarding. Elevation, $40^{m}.6765$.

B. M. 90 is the center of head of a copper bolt leaded horizontally into the front face of the brick pillar that supports the southwest corner of the portico of Col. H. B. Keep's house on Glen Annie Plantation, about 2 miles above Mayersville, in Issaquena County, Mississippi. Elevation, $40^{m}.0159$.

B. M. 95 is the center of head of copper bolt leaded horizontally into the west side of the brick chimney at the north end of the dwelling-house on Wade Lawn Plantation, owned by Mr. V. Preston, about one-fourth mile below Mayersville, Miss. The bolt is about 2 meters above the ground. Elevation, $40^{m}.3005$.

B. M. 105 is the center of head of a copper bolt leaded horizontally into the brick chimney of gin-house on Reserve Plantation, owned by Mr. S. Duncan. The bolt is in the center of a brick on the west side of the chimney and about $1\frac{1}{2}$ meters from the ground. The gin-house is about one-fourth mile from the levee, and about $3\frac{1}{2}$ miles above Ben Lomond P. O., Issaquena County, Mississippi. Elevation, $39^{m}.2393$.

B. M. 112 is the center of head of copper bolt leaded horizontally into the brick chimney of gin-house on Ben Lomond Plantation, owned by George M. Brown. The gin-house is about 600 meters from the levee, and just back from Ben Lomond P. O. The bolt is in the center of a brick on the west side of the chimney and about one meter and a half from the ground. Elevation, $39^{m}.4508$.

B. M. 124 is the center of head of copper bolt leaded horizontally into the brick foundation of Tallulah post-office building, better known as "Old Tallulah Court-House," about 2 miles above Tallulah Landing, Issaquena County, Mississippi. The bolt is near the southeast corner of the house, and about 1 foot above the ground. Elevation, $37^{m}.9932$.

B. M. 128 is the center of head of copper bolt leaded horizontally into the brick foundation of the dwelling-house on Lockwood Plantation, owned by R. B. Phipps. The house is about one-third mile above Tallulah Landing. The bolt is near the southeast corner of the house, in the twentieth brick from the bottom and third from the southeast corner. Elevation, $38^{m}.5891$.

B. M. 137 is the center of head of copper bolt leaded horizontally into a brick pillar supporting the porch of dwelling-house on Elliston Plantation, owned by Mr. F. W. Hays, a little below Hays P. O., Issequena County, Mississippi. The bolt is near the middle and top of the first pillar to the right of the steps leading up to the porch.. Elevation, $38^{m}.4772$.

B M. 140 is the center of head of a copper bolt leaded horizontally into brick chimney of cotton-gin on Shiloh Plantation, owned by Mr. J. W. Heath. The bolt is in the fourth brick from a row of projecting bricks, near the center of the north side of chimney, and about 7 feet from the ground. The letters U. S. B. M. are cut in the surrounding bricks. Elevation, $40^{m}.0023$.

B. M. 150 is the center of head of a copper bolt leaded horizontally into brick chimney of dwelling-house owned by Mr. Z. Leatherman, about 4 miles below Hays's P. O., and about the same distance above Ingomar P. O., Issaquena County, Mississippi. The bolt is in the second brick from the southwest edge of chimney, and about 4.5 feet above the ground. Elevation, $38^{m}.3523$.

B. M. 153 is the center of head of a copper bolt leaded horizontally into brick chimney of cotton-gin, owned by Dr. J. W. Butts, on Tennessee Plantation, about 3.5 miles above Ingomar P. O., Issaquena County, Mississippi. The bolt is on the west side of chimney and near the southwest corner. The letters U. S. B. M. are cut in the surrounding bricks. Elevation, $38^{m}.0187$.

B. M. 161 is center of head of copper bolt leaded horizontally into brick chimney of a cabin on the Henderson Plantation, owned by Mrs. Emma E. Peck, in East Carroll Parish, Louisiana. The cabin is about three-fourths mile from Henderson's Landing. The bolt is in the east face of the chimney and the letters U. S. B. M. are cut in the surrounding bricks. Elevation, $36^{m}.4223$.

B. M. 162 is center of head of copper bolt leaded horizontally into west face of brick pillar of dwelling-house owned by Mrs. Emma E. Peck, on the Henderson Plantation, about one-eighth mile above Henderson Landing, East Carroll Parish, Louisiana. Elevation, $37^{m}.2306$.

B. M. 171 is center of head of copper bolt leaded horizontally into brick chimney of dwelling-house owned by Mrs. Sarah E. Nutt, on Ditchly Plantation. The house is about one-fourth mile above Omega P. O., Madison Parish, Louisiana. Elevation, 35^{m}.6283.

B. M. 179 is center of head of copper bolt leaded horizontally into brick foundation of dwelling-house owned by Mr. H. P. Morancy, on English Field Plantation, Madison Parish, Louisiana. The bolt is in the sixth brick from the top of the foundation and in the third from the northwest corner. The house is about three-fourths mile above Milliken's Bend and about a half mile from the river. Elevation, 35^{m}.9253.

B. M. 184 is center of head of copper bolt leaded horizontally into brick pillar supporting northeast corner of porch of dwelling-house owned by the Citizens' Bank of Louisiana, on River View Plantation, Madison Parish, Louisiana. The house is about one and one-fourth miles below Milliken's Bend, and about one-fourth mile from river. Elevation, 34^{m}.9761.

B. M. 188 is center of head of copper bolt leaded horizontally into east face of brick pillar supporting northeast corner of dwelling on Cabin Teele Plantation, owned by Mrs. L. R. Marshall. The house is about three and one-fourth miles below Milliken's Bend, and a half mile from the river. Elevation, 36^{m}.2719.

B. M. 197 is center of head of copper bolt leaded horizontally in center of face of middle brick of third course from top, of third pillar from northeast corner of porch of dwelling-house on Duck Port Plantation, Madison Parish, Louisiana, owned by Mr. G. L. Barrey. Elevation, 35^{m}.8365.

B. M. 207 is center of head of copper bolt leaded horizontally in the south chimney of dwelling-house on Echo Plantation, Madison Parish, Louisiana, owned by Mattingly and Flowerce. The bolt is in the third brick from the southeast corner and in the twenty-first course from the ground. Elevation, 35^{m}.9813.

B. M. 211 is center of head of copper bolt leaded horizontally in center of face of middle brick of eighth course from the ground of second pillar from southeast corner of porch of dwelling-house owned by Goodman and Bradford, on Willow Glen Plantation, Madison Parish, Louisiana. Elevation, 33^{m}.9698.

B. M. 215 is the end of the vertical ray of a five-rayed cast-iron star on the south end of parish clerk's office, a brick building near the court-house in Delta, Madison Parish, Louisiana. The star is a tie-rod plate, and is about 4 feet from the ground, and three feet from the southeast corner of the building. Elevation, 34^{m}.0836.

B. M. 225 is center of head of copper bolt leaded horizontally in center of face of middle brick of tenth course from the ground, of second pillar from southeast corner of dwelling-house owned by Mr. G. W. Bedford, on Point Place Plantation, Madison Parish, Louisiana. The house is about three-fourths mile from the river and opposite Warrenton, Miss. Elevation, 33^{m}.9202.

B. M. 232 is the center of head of copper bolt leaded horizontally in east chimney of dwelling-house owned by Mr. Orange Christmas, on Crystal Springs Plantation, Madison Parish, Louisiana. The brick is the second from the southeast edge of chimney and is in the twelfth course from the ground. The house is about 4 miles below Warrenton, Miss., and about 2 miles from the Mississippi River. Elevation, 32^{m}.9195.

B. M. 243 is center of head of copper bolt leaded horizontally in the middle of south face of southeast chimney, 15 inches from the ground, of Kellogg's P. O. building, Madison Parish, Louisiana. The building is owned by W. D. White of Kentucky and is about 400 meters from the river. Elevation, 33^{m}.1167.

B. M. 246 is top of a copper bolt in top of cement post 3 feet long and 8 inches in diameter, set in the ground on Sargent's Point Plantation, Madison Parish, Louisiana, owned by Mrs. Rachel Wilkinson. The cement post was set with top flush with surface of ground, and is about 600 meters from the river. It is near some cabins around which are water-oak and pecan trees. Two of the water-oaks, 11.2 and 10.5 meters distant from the bench-mark, were marked with triangular blazes. Elevation, 32^{m}.3326.

B. M. 258 is center of head of copper bolt leaded horizontally in a brick about 4 feet from the ground and about the middle of the north face of the north chimney of dwelling owned by Mr. George W. Turner, on Point Pleasant Plantation, Tensas Parish, Louisiana. The house is about one-third mile from the river. Elevation, 32^{m}.9677.

B. M. 262 is center of head of copper bolt leaded horizontally in center of face of middle brick of the twelfth course from the foundation in the south face of the east chimney of dwelling owned by Mr. E. Loyd, on Riverside Plantation, Tensas Parish, Louisiana. The house is about one-half mile from the river. Elevation, 31^{m}.6104.

B. M. 272 is top of copper bolt in top of cement block 18 inches long and 8 inches in diameter set in ground on Hard Times Landing, Tensas Parish, Louisiana, owned by Mrs. G. H. Hollingsworth. It is about 600 meters from the Mississippi River, about 50 meters from the bank of Lake St. Joseph, and near a cabin. Elevation, 30^{m}.3201.

B. M. 280 is center of head of copper bolt leaded horizontally in center of face of middle brick of tenth course from the foundation, in the southeast face of brick chim-

ney of gin-house on Waveland Plantation, Tensas Parish, Louisiana, owned by Mr. John Bondurant. The gin-house is about 500 meters from the bank of the river and about 8 kilometers above St. Joseph, La. Elevation, $30^{m}.0533$.

B. M. 286 is center of head of copper bolt leaded horizontally in center of face of fourth brick from northeast corner, twenty-third course from ground, of brick chimney of gin-house on Panola Plantation, owned by J. M. Gillespie. It is about 2 kilometers above St. Joseph, La., and about 1 kilometer from the river. Elevation, $31^{m}.1115$.

B. M. 291 is center of head of copper bolt leaded horizontally in north face of brick chimney of gin-house on Duck Pond Plantation, owned by Captain Robert Worrell. The bolt is in fifth brick from the northeast edge of chimney and in the seventh course below the projecting course. The gin-house is about 2 kilometers below St. Joseph and about 500 meters back from St. Joseph Landing. Elevation, $29^{m}.3873$.

B. M. 297, or LXXIII, is a marble post buried in the ground on the left of, and quite near, the steps leading to the front entrance of Captain E. L. Whitney's residence on Villa Clara Plantation, Tensas Parish, Louisiana; Bieller's Landing is on Villa Clara Plantation. The post is 5 inches square and 2 feet 6 inches long, and the top is marked thus:

U. S.
B. ▭ M.

The bottom of the cavity was used as the bench-mark. Elevation, $27^{m}.8439$.

1881.

B. M. LXXII is bottom of cavity in top of marble post, 5 inches square and 2.5 feet long, buried in the ground on the right and near the front entrance of Mr. W. H. Goldman's residence on Stockridge Plantation, at Kemp's Landing, Tensas Parish, Louisiana. Elevation, $28^{m}.3007$.

B. M. LXXI is bottom of cavity in top of marble post, 5 inches square and 2.5 feet long, buried in the yard on the left of, and quite near, the steps leading to the front entrance of Mr. A P. Martin's residence at Water Proof, Tensas Parish, Louisiana. Elevation, $26^{m}.6946$.

B. M. LXX is a cross cut on the top surface of an old cistern which is in an open field about 3 miles below the town of Water Proof, La. The cistern is about 50 meters from the main levee and 190 meters from junction of main and old levees, marked with the letters U. S. B. M., 1881. Elevation, $26^{m}.8774$.

B. M. LXIX is the head of copper tack in cedar stub which marks the center of triangulation station Duncan, just above L'Argent, Tensas Parish, Louisiana. Elevation, $28^{m}.0397$.

B. M. LXVIII is a cross cut on top of cistern in yard of house on Agnasea Plantation, about one-half mile below L'Argent Landing. The bench-mark is on west side of top of cistern, marked with the letters U. S. B. M. Elevation, $27^{m}.3280$.

B. M. LXVII is bottom of cavity in top of marble post buried in the ground within the inclosure on the right of Stanton & Brandon's Store, and near the corner of the store at Gibson's Landing, Concordia Parish, Louisiana. The top of the post is about 4 inches above ground. Elevation, $26^{m}.3175$.

B. M. LXVI is bottom of cavity in top of marble post buried in the ground on the right of, and quite near, the steps leading to the front entrance of Mr. E. W. Walls' residence at Bullit's Bayou (Good Hope) Landing. The top of the post projects 4 inches above the ground. Elevation, $25^{m}.8329$.

B. M. LXV is bottom of cavity in top of marble post buried in levee opposite an old brick wall about 4.5 miles above Vidalia, La. The post is 11 meters south of a lone tree and 10 meters south of the brick wall, and its top projects 4 inches above ground. Elevation, $27^{m}.0146$

B. M. LXIV is cross cut in top of iron screw pile marking triangulation station Palo Alto, about one mile north of Vidalia, La. It is on the west side of the road and about 250 meters from it. Elevation, $25^{m}.9332$.

B. M. LXIII is top of copper bolt in center of top of monument marking southeast end of the Vidalia base line. The monument is in a lot immediately back of the courthouse and jail at Vidalia, is 14 inches square at top, and projects 14 inches above ground. Elevation, $24^{m}.8472$.

B. M. LXII is bottom of cavity in top of marble post buried in the ground near steps leading to the front entrance of Judge W. H. Hough's residence in Vidalia, La. The post is on the right of the steps and its top is about 4 inches above ground. Elevation, $25^{m}.4965$.

B. M. LXI is cross cut in top of iron screw pile marking triangulation station Gaither. It is about one mile below Vidalia, in an open field and on right-hand side of road leading to Vidalia. Elevation, $24^{m}.9452$.

B. M. LX is bottom of cavity in top of marble post buried in the ground on the right of, and quite near, the steps leading to the front entrance of Mr. Abner Crother's residence on Moro Plantation, about 9.75 miles below Vidalia. The top of post is about 5 inches above ground. Elevation, $25^{m}.1543$.

B. M. LVIII is center of top of granite post marking triangulation station Ashley, on Ashley Plantation, Concordia Parish, Louisana. It is about 2 miles below Morville

Landing is 300 meters south of Willow Grove, 160 meters east of levee, and 15 meters from river. Elevation, 22m.6927.

B. M. LVII is bottom of cavity in top of marble post buried in ground just east of steps leading to front entrance of residence on Deer Park Plantation, owned by Mr. A. D. Rawlings. The top of the post is about 3 inches above ground. The house is about one-fourth mile from the river, south of the main road leading to Vidalia, and about 24 miles below Vidalia. Elevation, 24m.2349.

B. M. LVI is center of top of limestone post marking triangulation station Pecan, on Pecan Plantation, owned by Mr. Sargent Shields, Concordia Parish, Louisiana. The station stands 30 meters from the bank on the top of the State levee running across Esperance Point. A small levee starts out to the west 4 meters to the north of the station. It is 50 meters south of where road crosses main levee. Elevation, 25m.0699.

B. M. LV is top of marble post buried in the ground to the right of the steps leading to the front entrance of the residence on Braleston Plantation, near Fairview P. O., Louisiana. The top of stone is about 3 inches above ground. Elevation, 23m.3177.

B. M. LIV is top of granite post buried in the ground on the left of the steps leading to the front entrance of Mr. William G. Walton's residence on Ashland Plantation near Bougere P. O., Louisiana. The top of stone is about 3 inches above ground. Elevation, 23m.5622.

B. M. LIII is top of granite post buried in the ground to the right of the steps leading to the east entrance of Mr. Ed. Pullen's residence, at Black Hawk P. O., Louisiana. The top of post is about 3 inches above ground. Elevation, 22m.1282.

B. M. LII is cut in the brick top of cistern used to supply with water the engine of gin-house on Ballamagan Plantation, Concordia Parish, Louisiana. The cistern is quite near, and on the right of road leading from Point Breeze to Black Hawk, and is about 3 miles from the latter place. The B. M. is marked thus: B. $\frac{\text{U. S.}}{\text{LII.}}$ M. Elevation, 23m.3903.

B. M. LI is top of copper bolt in top of stone monument marking the northeast end of Lum's Point base line on Point Breeze Plantation, Louisiana, owned by Mr. Trager. Elevation, 22m.3926.

B. M. L is top of copper bolt in top of stone monument marking the southwest end of Lum's Point base line, in Concordia Parish, Louisiana, nearly opposite Fort Adams, Miss. The bench-mark is on the place owned by Mr. Lum, of Vicksburg, and occupied by Mr. A. A. Cox. It is on the west side of a farm road in a cultivated field and very near a gate. Elevation, 22m.3519.

B. M. XLIX is a granite post buried at the southwest corner of the house of Mr. J. R. Mathews, just above the corners at the upper end of the village of Fort Adams, Wilkinson County, Mississippi. Elevation, 27m.0271.

B. M. XLVIII is a granite post buried at the southeast corner of the store of Lehmann and Lauenburgh, back of an old cotton-gin a short distance above Clarksville Landing, Wilkinson County, Mississippi. The store is at the point where the road from Fort Adams, after crossing the hills, comes out on the low plateau extending to the river. Elevation, 30m.1924.

B. M. XLVII is a granite post placed close to the back fence of the yard around dwelling on Tarbert Plantation, Wilkinson County, Mississippi. The plantation lies between Angola and Langside Plantations, extends beyond the State line, and is owned by Mr. Jenkins, of Natchez. Elevation, 21m.3066.

B. M. XLVI is cut on top of the circular wall forming the mouth of a cistern, just back of house on Angola Plantation, West Feliciana Parish, Louisiana. It is nearly opposite mouth of Red River. The brick work is covered with cement, through which a square aperture was cut, exposing the upper surface of the brick. This brick surface was used as the bench mark. Elevation, 22m.5666.

B. M. XLV is a granite post placed in the yard of Mr. Archie Smith, near Hog Point Landing, Smithland P. O., Point Coupee Parish, Louisiana. Elevation, 20m.9832.

B. M. XLIV is a granite post placed just beside the front steps of Dr. A. A. Batchelor's house, on Belle Vista Plantation, on Old River, Point Coupée Parish, Louisiana. Elevation, 19m.9110.

B. M. XLIII is a granite post in front of house of Mr. Edgard Lacour, close to Raccourci Landing, Point Coupee Parish, Louisiana. Elevation, 17m.9799.

B. M. XLII is top of granite post buried with top 3 inches below surface of ground, at the junction of the "Grand Levee" and a branch levee running to Morganza Landing. It is about half a mile below Morganza. Elevation, 20m.4780.

B. M. XLI is a granite post placed beside the front steps of house on Morrison Plantation, Point Coupee Parish, Louisiana. Elevation, 18m.4308.

B. M. XL is a granite post placed by the side of the front steps of house on Pogras Plantation, Point Coupee Parish, Louisiana. It is about half a mile above the "New Road" leading to the Court House at False River. This part of the parish is known as the "Point Coupee Settlement." Elevation, 17m.5072.

B. M. XXXIX is top of copper bolt in limestone monument at the northwest end of base line directly opposite Bayou Sara, Louisiana. Elevation, 18m.263.

B. M. XXXVIII is top of copper bolt in limestone monument marking southeast end of base line nearly opposite Bayou Sara, Louisiana. Elevation, 18m.1595.

B. M. XXXVII is upper edge of a mark cut on the front of the "Saint Claude Store" at Waterloo, Point Coupee Parish, Louisiana. The store is built of brick and belongs to Mr. Robin. The bench-mark is nearly on the middle line of the front and is 5.44 feet above the ground. Elevation, 19m.8775.

B. M. XXXVI is a granite post placed in front of the house of Mr. C. Devall, Sans Souci Plantation, West Baton Rouge Parish, Louisiana. The house fronts on a bayon, the remains of the old river channel, and is on the road leading directly back from Hermitage Landing. Elevation, 17m.6413.

B. M. XXXV is a granite post placed in the back corner of the inclosure around the "Kelson Store," owned by Capt. John J. Brown, West Baton Rouge Parish, Louisiana. The store is opposite the upper part of Profit Island. Elevation, 16m.6859.

B. M. XXXIV is a granite post in front of the house of Mr. B. Chamberlain, jr., and is about a half a mile above Lobdell's Store, at Grossman's Landing, West Baton Rouge Parish, Louisiana. Elevation, 15m.7861.

B. M. XXXIII is a granite post buried in front of the pillar at the northwest corner of house of Mr. A. Guesnard, Belmont Plantation, West Baton Rouge Parish, Louisiana. Elevation, 15m.5322.

B. M. XXXII is a granite post buried in the flower garden in front of house on plantation of Mr. J. H. Gay, West Baton Rouge Parish, Louisiana. The plantation is directly opposite the city of Baton Rouge, and just below the ferry landing. Elevation, 14m.8454.

B. M. XXXI is a bench-mark of the U. S. Engineers. It is the edge of one of the foundation courses of the tower on the north side of the western entrance to the Statehouse at Baton Rouge, Louisiana. It is marked, U. S. E. Elevation, 15m.1920.

B. M. XXX is the surface of the limestone monument at the north end of Baton Rouge base line. It is situated in a cane-field belonging to Messrs. Weeks and McCullan, 700 meters south of Baton Rouge city limits, and 97 meters from river road. Elevation.

B M. XXIX is a point surrounded by a shallow groove upon the top of the limestone monument at the south end of Baton Rouge base line. It is 1,622 meters from North Base, is between the river road and the levee, is 42 feet from angle of levee and 29.7 feet from corner of fence. Elevation, 14m.7455.

B. M. XXVIII is a granite post placed in the front yard, close to an old brick pier, of house on Arlington Plantation, East Baton Rouge Parish, Louisiana. The plantation is 4 miles below Baton Rouge, and belongs to Mr. Shannon. Elevation, 15m.5313.

B. M. XXVII is a granite post buried close to the front gate of inner yard about Mr. Conrad's house on Cottage Plantation, about 8 miles below Baton Rouge, Louisiana. Elevation, 15m.6911.

B. M. XXVI is a granite post, 8 meters from fence at side of road and on the line of a row of old fig trees, 23 meters east of house on Hollywood Plantation, East Baton Rouge Parish, Louisiana. The house is 12 miles below Baton Rouge, half a mile above Manchac P. O., and belongs to Mr. H. Vonpuhl. Elevation, 15m.3510.

B. M. XXV is a granite post in the northeast corner of the yard of Mr. Walter Humble, on Anger's Plantation, Iberville Parish, Louisiana. The house is about 5 miles above Plaquemine, is a short distance west of the road which runs across the point to Forlorn Hope P. O. Elevation, 14m7924.

B. M. XXIV is a granite post near the corner of the yard, about house of Mr. Daigre, the overseer of Anger's Plantation, Iberville Parish, Louisiana. The house is the second one below Forlorn Hope P. O., and just above a bend in the road. Elevation, 14m.2170.

B. M. XXIII is a granite post in the front yard of Julian Grassin, next to Saint Gabriel's church, Saint Gabriel, La. The plantation formerly belonged to Dr. Pritchard, and is 4 or 5 miles above Bayou Goula. Elevation, 13m.3389.

B. M. XXII is a granite post buried in yard on plantation of Leach, Seaward and Thompson, about a mile above Bayou Goula, and on opposite side of river. The house is a low frame building, and there is a pumping-engine on the levee about 200 yards above the house. Elevation, 14m.2773.

B. M. XXI is a granite post buried near angle formed by a wing and central portion of house owned by Mrs. Buddington, on Indian Camp Plantation, Iberville Parish, Louisiana. Elevation, 14m.4248.

B. M. XX is a point on the upper surface of the projecting brick foundation running around the house, on Southwood Plantation, formerly called Hard Times, at the extreme upper end of Ascension Parish, Louisiana. A square opening was cut through the stucco covering so as to allow the rods to rest upon the brick. The bench-mark is marked with the letters U. S. B. M. and the date 1880. Elevation 13m.5083.

B. M. XIX is a cross-cut on the head of an iron bolt in the north end of the brick

warehouse at Ashland Landing, Ascension Parish, Louisiana. The bolt is 4.8 feet above the ground, and is in the middle of the wall. The bench-mark is marked by the letters U. S. B. M. XIX, 1880, cut in the wall. Elevation, $15^{m}.7964$.

B. M. XVIII is a granite post buried in the front yard of Mr. V. P. Mirre, Ascension Parish, Louisiana. The place is about 4 miles above Donaldsonville, and formerly belonged to E. Dickharvy. Elevation, $12^{m}.3999$.

B. M. XVII is a granite post buried in yard at side of house of Mr. Heath on left bank of river about a mile above Donaldsonville, La. Elevation, $12^{m}.9014$.

B. M. XVI is point surrounded by a groove forming a small square on limestone slab at side of front steps of Mr. Hagan's house, about 6 miles below Donaldsonville. It is marked with the letters U. S. B. M. Elevation, $13^{m}.8985$.

B. M. XV is on the corner of the stone pedestal of a pillar by the side of the entrance to the house of Mr. Colomb, Saint James Parish, Louisiana. The point on which the rods were held is surrounded by a groove cut in the stone, and is marked by the letters U. S. B. M. XV. Elevation, $13^{m}.4721$.

B. M. XIV is the bottom of a shallow square cavity cut in the granite step of the south door on the front or west side of the Convent of the Sacred Heart, Saint James Parish, Louisiana. The bench-mark is marked with the letters U. S. B. M. Elevation, $13^{m}.6700$.

B. M. XIII is a horizontal line cut in the iron post on the south side of the gateway in front of Jefferson College, on College Point just below the settlement known as Saint Michaeltown, Saint James Parish, Louisiana. The post was marked with the letters XIII, U. S. B. M. LXXX. Elevation, $14^{m}.2580$.

B. M. XII is bottom of a square cavity cut in the cement pedestal of the column at the southwest corner of house of Mr. Louis Lebourgeois on Belmont Plantation, Saint James Parish, Louisiana. It is marked with the letters U. S. B. M. Elevation, $12^{m}.1979$.

B. M. XI is upper edge of triangular groove cut in west side of small pier supporting the southwest corner of a wooden warehouse which stands upon the levee nearly in front of house of Mr. Wallis on Belle Alliance Plantation, Saint James Parish, Louisiana. The center of the line is 4.2 feet above a projecting foot-course, and 1.3 feet from the outer corner of the pier. It is marked by the letters U. S. B. M. 1880 IX. Elevation $13^{m}.3741$.

B. M. X is a point surrounded by a groove cut in the upper surface of the granite sill at the foot of the iron stairway in front of house of Mr. Joseph Lebourgeois, on Mount Airy Plantation, Saint John Baptist Parish, Louisiana. It is marked by the letters U. S. B. M. 1880. Elevation, $11^{m}.8547$.

B. M. IX is upper edge of horizontal groove cut in the west wall at the southwest corner of store on Terre Haute Plantation, Saint John Baptist Parish, Louisiana. The groove is 5.15 feet above the ground, and 0.32 feet from the edge of the brick wall. It is marked by the letters IX U. S. B. M. 1880. The plantation is just above the settlement at Bonnet Carré, and belongs to Mr. James W. Godberry. Elevation, $13^{m}.0218$.

B. M. VIII is the head of a long iron bolt in a cement post in the yard of Mr. Adam Lasseigne, just above the post-office at Bonnet Carré, La. Elevation, $11^{m}.2570$.

B. M. VII is the head of an iron bolt in a cement post at the foot of a large pecan-tree in front of house on estate of Mr. Ambruster, Saint Charles Parish, Louisiana. It is about a half mile below the Gypsy Plantation, owned by Mr. Labranche, which, is at the bend of the river below Bonnet Carré Crevasse. The hole above the bench-mark was filled with broken bricks, and covered over with earth. It is 1.7 and 1.9 feet, respectively, from two nails driven in projecting roots of the tree. Elevation, $11^{m}.1901$.

B. M. VI is the upper surface of the square pedestal of the pillar on the eastern side of the front steps of Mr. Leon Sarpy's house, on Prospect Plantation, Saint Charles Parish, Louisiana, and nearly opposite Hahnville. The pedestal is of brick, covered with hard stucco. The point on which the rods where held is surrounded by a groove forming a square, and the letters U. S. B. M. 1880, are cut on the surface. Elevation, $10^{m}.5504$.

B. M. V is the surface of the stone sill of the footway on the western side of the main entrance to Destréhan Plantation, owned by Judge Rost, Saint Charles Parish, Louisiana. The point on the stone on which the rods were held is surrounded by a groove cut in the stone, and marked by the letters U. S. B. M. Elevation, $11^{m}.1258$.

B. M. IV is the head of an iron bolt imbedded in a cement post on the levee about 4 miles above Kennerville, and nearly in front of the house of Norbert Longue. It is 9.4 feet from the second and 11 feet from the third tree from the road on the east side of the avenue leading to the river. Elevation, $11^{m}.6957$.

B. M. III is the bottom of a square depression in the top of a granite block buried in the yard of Dr. Gustine at Kennerville, Jefferson Parish, Louisiana. The stone is 26 meters in front of the house, and 3.5 meters from a date palm, and is marked with the letters U. S. B. M. Elevation, $9^{m}.6899$.

B. M. II is the bottom of a slight depression in the upper surface of a cement post on the inner levee in front of Mr. Soniat's house at Twelve Mile Point, 5 miles above Corrollton, La. It is 24 paces above the corner of the road, and 25 paces below the gateway. The top of the post is marked with the letters U. S. B. M. 1880. Elevation, $11^{m}.9489$.

B. M. I is the intersection of two cross lines cut on the iron sill of a door at the northwest corner of the depot at Carrollton, La. It is marked with the letters U. S. C. S. B. M. 1875. Elevation, $9^{m}.0272$.

APPENDIX C.

REPORTS OF CHIEFS OF PARTIES UPON FIELD WORK OF TOPOGRAPHY AND HYDROGRAPHY, 1883–'84.

1.—*Report of Assistant Engineer J. A. Ockerson, Randolph Point to Frame's Chute, and Campbell's Landing to Saint Louis Landing.*

OFFICE MISSISSIPPI RIVER COMMISSION,
Saint Louis, Mo., September 1, 1884.

SIR: I have the honor to make the following report on the field work done under my direction during the season of 1883–'84. Accompanying this report are also the results of investigations concerning sliding banks, changes in the bank-line and section of the Mississippi River between Cairo and Saint Louis Landing, and data concerning the relative elevations of old river banks and those of later formation.

In accordance with your instructions to proceed to Randolph Point to continue the survey of the Mississippi River, the party left Saint Louis on October 10, 1883, for Cairo, where the quarter-boats were in readiness to receive them. The organization was as follows: J. A. Ockerson, chief of party; topographers, C. W. Clark, N. B. Craig, J. C. Quintus, H. P. Ritter, F. Felkel, and F. B. French; hydrographers, B. H. Colby and J. N. Allison; levelers, I. O. Walker and C. Brainard; plotting and computing, E. J. Jolley; a launch crew of 3; galley crew, 6; leadsmen, 2; rodmen, 8; boatmen and axmen, 20.

The supplies had already been delivered on board, and on the arrival of the parties the boats were taken in tow by the steamer Patrol and reached Randolph Point on the 15th of October. The topographers began work immediately.

The instructions required that the work of 1879–'80 should be utilized as far as practicable. But little use could be made of it as the survey was done at a high-water stage. The triangulation and levels were, of course, available.

The reach from Randolph Point to head of Frame's Chute was completed on October 30, and after taking on coal at Memphis the party moved down to Campbell's Landing to resume the survey where the work under General Comstock closed in 1878. Work began at this point on November 1, and was completed to Saint Louis Landing on December 28.

The survey embraces, outside of the usual mile limit, the Saint Francis River from a point opposite Dupries Landing to the mouth, a distance of about 18 miles, McKinney Bayou, and the following lakes: Beaver Dam, Flower, Porter, Eagle, Moon, Mud, and Horseshoe. The bluff line was also located from near the mouth of the L'Anguille to about 4 miles below Helena, and from the Loosa Hatchie River to a point opposite the head of Island 40.

The season throughout was unusually good both as to stage of river and weather. Out of the sixty-three working days the party was in the field, there were only three rainy days, on which no field work was done.

On the completion of the survey to Saint Louis Landing, where it closed on the work of 1881, the party was disbanded.

The steamer Patrol arrived on the day the work was finished, and on the day following the quarter-boats were taken in tow for Memphis.

The accuracy and progress of the work must be largely credited to the fidelity and industry of the assistants.

The following tabulated statement shows in detail the amount of work done:

Number of miles of river surveyed	92
Number of square miles of topography	227
Number of square miles of hydrography	64
Number of soundings	15,064
Number of sextant angles read	14,708
Number of working days	63
Average number of miles of river per month	37
Average number of square miles of topography and hydrography per month	11

DEPOSITS MADE BY THE RECENT FLOODS.

In some places the deposits have been quite heavy. On both sides of the river above Frame's Chute, even on the high bank, there has been a deposit of several inches since the survey of 1877–'78. On the lower lands the deposit amounts to 5 feet in some cases. These deposits sometimes consist of pure sand, which ruins cultivated lands and even kills the trees. One curious effect of the deposit was noticed on triangulation lines which were cut through young cottonwoods and willows 3 inches in diameter and upwards. The stumps which were from 1 to 3 feet high, have been covered with the deposit, and the fallen trees either washed away or covered up, so that now the line is left intact and smooth.

There is not so much as a weed in it, and all evidences of the cutting except the opening have disappeared.

There are numerous places where no deposits have been made, although the conditions are apparently the same as where there are heavy deposits. The first surveys are so meager in detail that a satisfactory comparison concerning deposits in general cannot be made.

Deposits of gravel have been noticed on the highest lands. This may have come from the logs and trees floated from the bars by the rising river. The heavy sand deposits noted must have been carried in suspension and dropped where the velocity was diminished by the water leaving the channel.

STABILITY OF STONE LINE BENCH-MARKS.

Nearly all of the bench-marks were found intact after having stood the tests of the floods for three years. Some of them were covered to a depth of several inches by deposits of silt and sand. As a rule the inhabitants do not molest them. Occasionally a fisherman in need of sinkers digs them up, and after breaking them into suitable sizes ties the pieces to his net. One was found with the lead and copper bolt dug out. The surface marks were not frequent nor conspicuous enough.

It is very important to have numerous surface marks or the bench-marks will be lost in consequence of changes in bank line, clearing off or growing up of timber, and deposits of silt.

I would here call attention to the advisability of limiting the number of bench-marks in the same locality. It has been the custom of each party sent out for high-water slope, low-water slope, &c., to establish independent bench-marks. Hence it frequently happens that within a radius of a few hundred meters may be found P. B. Ms., B. Ms., B. M. L., B. M. E., &c. After the value of one has been well determined it should be used. A multiplicity of bench-marks in the same vicinity must ultimately result in confusion, while there is no good reason apparent why every new party sent to the field should have a separate and exclusive series of benches.

NARROW CHANNEL.

Just below Mhoon Lake Landing the river becomes very narrow in consequence of the sand-bar pushing far over into the bend. The width between shore lines at a stage about 6 feet above low water is only 290 meters. The maximum depth in the narrowest part is about 65 feet.

SLIDING BANKS.

In Old Town and Montezuma bends are two peculiar cases of sliding bank, where the land settles down bodily, leaving the trees upright, where they act as a natural revetment and remain a long time before being washed away. Plats of these two localities are submitted herewith, which show these bends and sections of same. The slide in Old Town Bend extends, from a point three-fourths of a mile above the landing, down-stream for a distance of about 2¼ miles. Near the lower end the slide reaches a width of 300 feet. The disintegration seems to be very slow after the ground settles. The survey of February, 1881, shows the outer line of trees in the same position as given by the survey of December, 1883, for more than half the length of the slide. Near the lower end the caving amounts to about 30 meters per year. The deepest part of the channel runs very close to the submerged trees.

The soil of the adjacent bank is, a tough alluvial clay covered with a growth of heavy timber. The presence of cypress, and the low land, indicate that it was formerly a swamp or lake, or it may have been the bed of the river at some remote period. The water in the bayou and lake back is some 10 feet higher than low water in the river.

In Montezuma Bend there is a slide about half a mile long and 100 feet wide in the

broadest part. The shore-line in the apex of the bend has receded about 20 meters a year since the survey of 1878. The banks consist of layers of clay and sand. They are formed by deposits in the old river-bed after the cut-off at Mhoon Lake. The old river bank was undoubtedly near where the levee is now located. It will be observed that a pond lies parallel to the shore-line for the entire length of the slide. The water in the pond lies several feet higher than the ordinary water surface in the river.

It is probable that these slides are due to the washing out of the sand layers by the river, aided very largely by the water in the ponds near by. The latter lying so far above the river play an important part in the destruction of the banks.

This is probably the reason why the banks cave more rapidly when the river is below the medium stage and falling rapidly. This is especially the case with banks composed wholly or partly of clay; sandy banks cave at all stages.

In order to ascertain how far the influence of surface water extends, 66 cases of caving banks between Memphis and Natchez have been examined in detail, with the following results: In 25 cases where there is rapid caving, there is more or less standing water near the river. The banks in these cases are generally more sandy and friable than the two cases above noted, which probably accounts for their coming in smaller fragments.

The other cases are generally traceable to obstructions in the channel which forces the current against the bank, or to the loose sandy nature of some of the banks.

STABLE BANKS.

There are bends where the banks are quite stable, and in some of these cases the shape of the channel is such that caving would naturally be expected. Between Island No. 1 and Island No. 10 we find "Iron Banks" and "Chalk Bluffs" where the river is held by the bluffs. In the bend below Hickman the caving is slight. The bank is composed of layers of clay separated by sand. For 3 miles the main current is kept out from the bank, probably by underlying rocks or clay lumps. Below James Bayou the bank is very largely clay and caves slowly.

In the next available reach, which is between Caruthersville and Frame's Chute, the bend above Booth's Point is found to be quite stable. The bank is said to be mostly blue clay.

Opposite Island No. 18 the bank is clay and sand, but a bar keeps the current away from the bank and it caves but little. Chickasaw Bluff No. 2, near the whirlpool, caves slowly. In the bend opposite Island No. 40 there has been but little caving. A bar has formed which is attached to the concave bank.

Above the mouth of the Saint Francis River the bank is mostly clay. For $2\frac{1}{2}$ miles the current follows the bank closely and yet the caving is slight. One point in particular which juts out some 50 feet from the bank and is not more than 10 feet wide on top has stood the wear of the current for several years. It was noticed in the survey of 1878 and has changed but little since then.

The pertinacity with which deep indentations in the banks remain for years in the same locality is as remarkable as the stability of the clay points. Cases have been noticed where they have existed for several years, although the entire bank-line has receded over 1,000 feet.

ELEVATIONS OF PRESENT RIVER BANKS AS COMPARED WITH BANKS OF CUT-OFF LAKES.

It is frequently stated that the banks of the old river lakes are higher than the present river banks. It is generally conceded that the banks of alluvial streams reach an elevation equal to the plane of mean high water.

If the first proposition is true, then the floods which deposited these old river banks, dating back many years prior to the settlement of the Mississippi Valley, must have been higher than those of recent years of which we have authentic records.

This does not accord with the theory that cutting down the forests, bringing the land under cultivation and confining the river between levees, all tend to increase the flood heights.

It is to throw some light on these questions that an examination has been made of all cases where the elevations of the old river banks were determined by the recent surveys.

The elevations are generally reliable to the nearest foot. They were determined by vertical angles, read forward and back with a transit. If the elevations were more numerous, the comparisons would of course be more satisfactory.

The distance given in the following descriptions are measured from the present river bank to the farthest point in the old river lake. Maps of eight old lakes and adjacent river have been reduced and are submitted herewith.

They show the elevations in feet above the Memphis datum plane.

Beaver Dam Lake, near Austin.—Date of cut-off not known. Bank at the head of the

lake is the same elevation as the present river bank, and said to be above overflow. Head of the lake is about 3 miles from the river.

Eagle Lake, Terrapin Neck Cut-off.—Made in 1866. General elevations of bank is the same as that of present river bank. Land said to be above overflow. The head of the lake is 7 miles from the present river at the cut-off.

Yazoo Lake, at the mouth of Yazoo River.—Said to have been cut off in 1699. Land at the head of the lake has the same elevation as the adjacent river banks. Head of lake is 7 miles from river.

Palmyra Lake, Dan's Cut-off.—Made in 1867. Land at the head of the lake is the same elevation as the adjacent river banks. The levels are not well checked and the elevations may be erroneous. Head of the old bend is 7 miles from the river at the cut-off.

Lake Saint Joseph, Hard Times Bend.—Date of cut-off not known. It was probably made long before the Mississippi valley was settled. Elevations at head of lake towards the upper end are about 2 feet higher than adjacent river banks around Hard Times Bend. This part of the lake lies very near Palmyra Lake, and the bank elevations are the same as those of the latter lake. Hard Times Bend lies so far downstream from the part of the lake considered that lower elevations should be expected. The level notes around this lake are doubtful. The head of lake from present river is about 6 miles distant.

Lake Bruin, near Bondurant Landing.—Date of cut-off not known. No elevations are given at the head of the lake on the bend side. Elevations on the point side and the other elevations given are lower than the adjacent river banks. The head of the lake is 6 miles from present river.

Lake Saint John, opposite Fairchild's Bend.—Date of cut-off not known. The land around the head of the lake is about the same elevation as the adjacent river banks. The old bend is about 3½ miles from the present river bank.

Lake Concordia, above Natchez.—Has probably been cut off twice, date not known. At present rate of caving in Giles Bend another cut-off is threatened in the same locality. The land around old river is 5 to 7 feet higher than the concave bank of Marengo Bend, but this is undoubtedly on account of the rapid caving (220 feet per year during the past 70 years), which has prevented the deposit from keeping pace with it. The new-made land on the point opposite is as high as the highest land around the old bend.

To farther illustrate the effect of a cut-off take an ideal case. We know that the river banks have a slope about equivalent to that of the water surface or about 0.3 foot per mile. Then if the elevation of the bank at the upper end of the cut-off is 100 feet we can interpolate the other elevations around the old bend.

The land from the river banks back has a slope of several feet per mile. Hence it is evident that in consequence of this slope the land at the head of the lake is above overflow, even though it be no higher than the river banks proper.

Measuring around the old bend the distance is 15 miles with a total fall of 45 feet, or 2.2 feet per mile if measured through the cut-off. This excessive slope will eventually adjust itself by erosion of banks and bed, but for some time after the cut-off the banks immediately below the cut-off will be overflowed at a comparatively low stage while the banks above the cut-off are above overflow. Under normal conditions the bank at the lower end of cut-off would have an elevation of 99.1 feet instead of 95.2. An examination of the old cut-offs suggests that this difference has been eliminated by deposit below the cut-off.

It is also evident that in the cases examined the old and new river banks have nearly the same elevations, and consequently that the floods of late years do not differ materially in elevation from those occurring before the valley was settled.

CHANGES IN BANK LINE AND SECTION.

The later surveys afford a good opportunity of ascertaining the character and extent of the changes which have taken place since the surveys of 1879–'80. The data available at present embrace the portions of the river lying between Island No. 1 and Scanlan's Landing, Arkansas, and Commerce Cut-off and Saint Louis Landing.

Maps are submitted herewith, which show the changes in shore line and the location of sections compared. The shore-line on the bar side changes so rapidly with slight differences of stage of river, that a comparison of that side has generally been omitted.

Sections have been plotted which are nearly coincident in the two surveys, and therefore show the changes that have occurred in depth and form of section. In plotting, the bottom has been referred to the same plane, and the differences in the water surfaces show the difference in the stages at which the soundings were taken.

These comparisons are of peculiar interest as showing to some extent the effect of the great floods which have occurred in the interval between the two surveys.

CAVING BANKS.

The amount of caving shown on the accompanying sheets was determined by measuring the distance between the positions of the bank lines as located by the two surveys.

The initial points on which these two surveys depend are sometimes 3 or 4 miles apart, and there may be a slight difference in sketching between the intermediate points located with the stadia; hence the figures given must not be regarded as exact in any special case. As a whole they may be considered as very near the truth. Where the caving has been very slight the comparisons fail to show it.

In general, the advance of the bars into the bends has kept pace with the receding banks.

The amount and rate of caving is given in tabular form for the principal bends. As the greatest caving is most frequently found near the lower end of the bend it follows that the present tendency is to make the river more nearly straight.

From Island No. 1 to Island No. 10 the caving banks aggregate 209,850 feet in length in a distance of 55 miles, or an average of 3,816 feet per mile of river. The heaviest caving occurs in Puntney and Beckwith bends and near Island No. 10. The amounts of caving at different points are given in detail on sheets 1, 2, and 3 of the published series accompanying this report.

From Caruthersville to head of Frame's Chute the caving banks aggregate 502,000 feet in length in a distance of 115 miles, or an average of 4,365 feet per mile of river. The greatest caving is above Rucker's Point, Forked Deer Island and opposite bend, Morgan's Point and above Centennial cut-off. At Forked Deer Island it has caved 2,210 feet in 4 years.

From Commerce Cut-off to Saint Louis Landing the caving banks aggregate 392,520 feet in length in a distance of 77 miles, or an average of 5,098 feet per mile of river. The greatest caving is near Commerce Cut-off, in Bordeaux Chute, above Hardin's Point, at Trotter's Landing, and Jackson's Point. Near the lower end of Bordeaux Chute the entire river moved west a distance of 5,000 feet from 1880 to 1883, or at the rate of about 1,670 feet per year.

At Trotter's Landing the caving from 1878 to 1883 amounted to 1,560 feet. From 1878 to 1880 the caving along Helena Island amounted to 1,310 feet, while from 1880 to 1883 the caving was very slight.

The head of Shoo-Fly Bar has moved down-stream over half a mile in spite of the fact that it was largely composed of gravel.

Brinkley Tow-head, the tow-heads just below O. K. Landing, and a large portion of Montezuma Tow-head have been washed away.

Island No. 65, which in 1881 was 1¼ miles long and ½ mile wide, and covered with heavy timber, has entirely disappeared.

It will be noticed that the greatest changes have taken place on the last-named reach and near the cut-offs at Commerce and Bordeaux Chute.

If we take 60 feet as the distance from the top of the bank to the bottom of the river (it will average something more than that) along caving bends, and use the length and mean widths given in the accompanying plats we can compute the number of cubic yards moved by erosion of banks.

From Island No. 1 to Island No. 10 it is found to be 551,385 cubic yards per annum for each mile of river.

From Caruthersville to Frame's Chute, 999,041 cubic yards.

From Commerce Cut-off to Saint Louis Landing, 2,231,726 cubic yards. The latter includes the tow-heads and Island 65, which have been washed away.

CAVING BANKS.

Locality.	Length.	Maximum width of erosion.	Mean width.	Annual rate of erosion.
	Feet.	*Feet.*	*Feet.*	*Feet.*
Puntney Bend	20,000	720	350	87
Lucas Bend	35,000	620	266	67
Wolf Island Bend	20,500	260	140	40
Beckwith Bend	20,600	1,020	511	137
Hickman Bend	11,000	395	148	40
Island No. 8 Bend	23,300	260	170	48
Missouri Bend	20,000	787	502	136
New Madrid Bend	31,300	729	377	75
Noland's Landing	10,300	1,149	681	137
Darnell's Point	15,000	3,100	1,085	217
Point Pleasant to Ruddle's Point	28,750	623	356	71
Merriwether Bend	28,000	720	371	74
Little Cypress Bend	22,700	970	666	133

CAVING BANKS—Continued.

Locality.	Length.	Maximum width of erosion.	Mean width.	Annual rate of erosion.
	Feet.	*Feet.*	*Feet.*	*Feet.*
Reelfoot Bend	50,200	870	257	51
Little Prairie Bend	25,000	1,541	751	150
Booth's Bend	15,000	190	160	44
Coleman's Bend	28,100	560	337	92
Needham's Bend	33,300	790	395	108
Barfield Bend	37,600	990	370	106
Forked Deer Island	33,000	2,210	862	236
Canadian Reach	16,000	1,670	998	273
Ashport Bend	19,000	690	344	94
Elmot Bend	13,400	760	206	56
Craighead Point	11,000	560	288	78
Morgan's Point	11,000	990	501	137
Idaho Bend	54,300	1,040	341	93
Bateman's Bend	26,000	1,220	539	147
Centennial Bend	21,000	1,570	549	149
Fogleman Chute (both sides)	15,600	230	188	52
Beef Island	11,000	757	478	131
Bradley's Bend	13,300	460	237	65
Redman's Bend	16,000	623	310	85
Commerce Cut-off (partial)	8,850	2,950	2,460	820
Ashley Point	15,000	760	565	188
Brinkley Bend	23,100	2,460	798	263
Bordeaux Chute	13,800	2,050	1,142	381
Hardin's Point	13,900	1,160	418	139
Ship Island Bend	8,420	660	445	148
Harbert's Bend	20,000	210	148	49
Shoo Fly Bend	8,100	1,450	830	277
Hopefield Bend	11,700	1,480	820	164
Francis Bend	36,200	580	287	96
Trottear's Bend	19,000	1,700	1,220	407
Helena Bend	19,000	670	433	144
Montezuma Bend	18,600	300	207	69
Delta Bend	8,500	360	157	52
Horse Shoe Bend	16,700	420	283	94
Old Town Bend	20,000	530	270	90
Island 63	9,000	460	210	70
Hughey's	15,000	528	315	105
Island 64 Bend	15,000	760	345	115
Ludlow's Bend	30,000	400	301	100

CHANGES IN SECTION.

A careful analysis of the sections compared gives the following results:

Character of changes in river.	Island No. 1 to Island No. 10.	Caruthersville to Frame's Chute.	Commerce to Saint Louis Landing.	Total.
Narrower and deeper	18	30	26	74
Wider and deeper	10	38	5	53
Same width and deeper	5	5	7	17
Narrower and same depth	.....	6	3	9
Wider and same depth	3	5	4	12
Same width and same depth	.....	5	1	6
Total depth or deeper	.....	.....	.....	171
Narrower and shallower	6	8	9	23
Wider and deeper	4	24	17	45
Same width and shallower	6	3	3	12
Total shallower	.....	.....	.....	80

It will be seen from the above table that, out of the 251 sections compared, the last survey shows that the river is the same depth or deeper in 171 cases and shallower in 80 cases. It is the same width in 35 cases, narrower in 106 cases, and wider in 110 cases. In the vicinity of the improvements at Plum Point, say from Island 25 to Randolph, the sections show the same depth or deeper in 34 cases, and shallower in 10 cases. The increase in width in this reach is quite marked. The river is wider in 28 sections, narrower in 10 sections, and same width in 6 sections. The increase in depth occurs mainly in the bends and the decrease on the crossings. The greatest erosion of the river bed doe snot occur where the bank erosion is the greatest, but where the banks have been stable, or the channel contracted. A section near Hardin's Point has decreased in width 4,900 feet and increased in depth 45 feet. The effect of the stable banks near Columbus and Hickman has been a very decided increase in depth.

As a rule, decrease in width is accompanied by a corresponding increase in depth, and conversely, an increase in width shows a decrease in depth.

In the bends below Friar's Point, where is a great difference in the stages of the sections, it will be seen that the deepest sections belong to the highest stage. That is, the bottom seems to have been scoured out during the high stage or filled at the lower stage. Many of the sections show but little change.

Very respectfully, your obedient servant,

J. A. OCKERSON,
United States Assistant Engineer.

First Lieut. SMITH S. LEACH,
Secretary Mississippi River Commission.

2.—*Report of Assistant Engineer C. M. Winchell, Island No.* 1 *to Donaldson's Point.*

OFFICE MISSISSIPPI RIVER COMMISSION,
Saint Louis, Mo., June 1, 1884.

SIR: I have the honor to submit herewith a report concerning the field operations of the topographic party under my direction during the season of 1883-'84.

In obedience to your instructions I left Saint Louis on the evening of October 10, 1883, with the party, consisting of 10 assistant engineers, 2 recorders, 6 rodmen, 8 stadia men, 6 boatmen, 16 axmen, 1 steward, 2 cooks, 3 waiters, 1 watchman, and a tug crew of 3. We reached Cairo, Ill., and went on board the quarter-boats Tennessee and Pioneer on the morning of October 11. After taking on supplies at Cairo, the quarter-boats were towed to Island No. 1 by the iron launch which had been assigned to the party, and work was begun October 12. Assistant J. A. Paige, G. W. Wood, H. W. Kerr, F. B. Maltby, and G. H. French were assigned to topography; Assistant Moses Greenwood, hydrography; Assistants L. C. Jones and J. W. Dorst, levels; Assistant G. H. Whitney, office work, platting field notes of the survey; Recorder D. E. Perkins and C. K. Sharp read sextant angles and recorded in the sounding-boat.

The upper limit of our survey joined the lower limit of the topographic survey made in 1876–'77 by the U. S. Lake Survey under the direction of General C. B. Comstock, and it was intended to continue the same down the river to Caruthersville, Mo., but owing to lack of funds to carry on the work, the party was called in and disbanded December 1, at which time the survey had been completed to a point about 5½ miles above New Madrid, Mo., 45 miles above Caruthersville.

TOPOGRAPHY.

In addition to the usual limits of the survey, the line of bluffs was located by compass line from Island No. 1 to Reelfoot Lake and frequent determinations made of the difference of elevation between the top and bottom of the bluffs. Their height above the water surface of the river at medium stage ranges from 150 feet to 200 feet.

All of the lakes, ponds, and bayous between the bluffs and the river were surveyed by compass and stadia. Connections were made with two county lines in Kentucky, and three points on the State line between Tennessee and Kentucky. Several township and section corners of the United States land survey were also connected with this survey. Obion Creek, Bayou du Chien, and James Bayou were meandered from 2 to 5 miles beyond the prescribed limits of topography.

Assistant French made a survey of the head of Reelfoot Lake and about 7 miles of its length. In the report of the commissioners appointed by the States of Kentucky and Tennessee to locate and mark the boundary line between those two States, it is stated that it took them six weeks to run a line across Reelfoot Lake, "a feat never before accomplished," the obstacles being numerous sloughs, swamps, bayous, canebrakes, &c. Mr. French was only two weeks in crossing the lake and surveying both

shores by independent lines, it being impossible to locate one shore by intersections from the other, on account of dead trees in the lake and marsh grass along the shores. The State commissioners measured their distances with a chain. Mr. French used a compass and stadias.

The supposition that Reelfoot Lake was once the channel of the Mississippi River, is, in my opinion, without foundation in fact. It has none of the characteristic features of "old river" lakes, but is like the "sunk lands" of the Saint Francis Basin, very irregular in shape, shallow, and full of dead trees standing in the water. It is 5 feet to 12 feet deep, except in two places, where it is 20 feet deep. It was probably a cypress swamp which sank during the earthquake convulsions of 1811.

HYDROGRAPHY.

Sections were sounded about 350 meters apart and a longitudinal line sounded along the thread of deepest water over the entire reach of river surveyed.

The maximum depth found was 142 feet, and this depth was found both at Columbus and Hickman. At Hickman the river is very narrow, the wet section being not more than half as wide as it was at the same stage in 1879, but the depth has more than doubled in the same time. The narrowest place found was at Chalk Bank, where the gravel and sand bar projects from Wolf Island to within 275 meters of the opposite bank. Here, as at Hickman, the rocks at the base of the bluffs project some distance into the river and are from 3 feet to 15 feet below the surface at low stages.

LEVELS.

Several new permanent bench-marks were established, and at each stone line a river crossing was made with two instruments by simultaneous observations, and duplicate lines of levels carried from the crossing hubs to the B. M's. on the stone line. A continuous line of levels was run on the left bank checking in the precise level bench-marks which had previously been established.

CAVING BANKS.

No very marked changes have taken place in this part of the river since 1879. The caving in the bends has been continuous, but not very rapid, the greatest amount of cutting being at Parker's, above Hickman, where it reached a maximum of 274 meters in four years, and just below Slough Landing, in Missouri Bend, where it has caved 240 meters. Immediately above Hickman, at Bayou du Chien, it has caved 89 meters since 1879.

Résumé.

Miles of river surveyed	55
Square miles topography	136
Square miles hydrography	38
Total area surveyed	174
River crossings of levels	17
Cross-sections sounded	262

SLOPE TABLE.

Locality.	Distance.	Slope per mile.	Rising or falling.*	Cairo gauge-reading.
	Miles.	*Feet.*		*Feet.*
Island No. 1 to Columbus	11	0.16	±	9.97
Columbus to foot of Wolf Island	7	0.46	−	10.40
Foot Wolf Island to Salmon's Landing	7	0.34	+	19.40
Salmon's Landing to James' Bayou	11	0.23	±	20.38
James' Bayou to △ Birdsall	10	0.31	±	22.06
△ Birdsall to △ Everett	11	0.35	+	26.30
Mean slope for entire reach	57	0.32		

* + = rising; − = falling; ± = stationary.

I cannot too highly commend the diligence and skill of my assistants, upon whose zeal the favorable progress of the work so largely depends.

Very respectfully, your obedient servant,

C. M. WINCHELL,
Assistant Engineer.

First Lieut. SMITH S. LEACH,
Secretary Mississippi River Commission.

3.—*Report of Assistant Engineer L. L. Wheeler, Caruthersville, Mo., to Randolph Point, Tennessee.*

OFFICE MISSISSIPPI RIVER COMMISSION,
Saint Louis. Mo., August 1, 1884.

SIR: I have the honor to submit the following report upon the operations of the party in my charge during the season of 1883–'84.

The work assigned to the party was to make a topographical and hydrographical survey of that section of the Mississippi River between Caruthersville, Mo., and Randolph Point, Tennessee. The organization of the party was as follows: Chief of party, L. L. Wheeler; topographers, A. N. Darrow, O. W. Ferguson, E. E. Haskell, O. A. Orrman, A. H. Weber, J. W. Payne; hydrographers, H. B. Wood, Fred. Morley; levelers, A. E. Kastl, T. C. Thomas; draughtsman, A. Perrilliat; and 48 men.

In accordance with your instructions, the party left Saint Louis by rail the evening of October 10, and went on board the quarter-boats Illinois and Kentucky, at Cairo, Ill., the following morning. The boats were taken in tow the same day by the United States steamer Patrol, and reached Caruthersville the evening of October 13. Field work commenced Monday, October 15, on a line normal to the river at Caruthersville, and continued without interruptions of any kind until about January 1, when the weather became very inclement, and continued so until the end of the season. At the above date Brandywine Island had been reached, and the work remaining to be completed included Centennial and Brandywine Islands, Islands 37 and 39, and the main banks down to Randolph Point. The river at this time was rising fast and rapidly covering the low bars and islands, and bringing down large quantities of driftwood. The weather became intensely cold and a large portion of the time heavy fogs hung over the river, making it difficult to see signals or to do field work of any kind in the immediate vicinity of the river. The work was pushed down the main channel as fast as the weather would permit, and, January 5, was completed in and along the main channel to Randolph Point. The Patrol moved the party, January 6, to Viola Landing in the old river, behind Centennial Island. A heavy snow-storm set in the next day and ice commenced running the same evening. From that time until the end of the work the river was not free from ice, so that no hydrography could be done. The work on the main bank behind Centennial Island and Island 37 was completed by the parties walking to and from work through snow from 6 to 8 inches deep, part of the work being done on the ice. The Patrol returned to the party the evening of January 9, and remained until the morning of January 12, when finding it impossible to continue work and provisions being exhausted the party was disbanded and taken to Memphis by the Patrol. The work left unfinished includes the whole of Island 37 and that portion of Centennial Island lying outside of the old main bank, and the hydrography in the chutes behind these islands. The total number of days spent in the field was 94, of which 4 were spent in traveling, 2 were observed as holidays, 13 were Sundays, and 5 were too stormy for work, leaving 70 days in which work was done. The length of main river surveyed was 101 miles, the average daily progress being 1.07 miles or 1.44 miles per working day. The average daily progress in miles of river was very much diminished by the number of large islands to be surveyed. The total number of square miles of topography was 274, and of hydrography 80, making the total number of square miles surveyed 354, being a daily average of 3.76 square miles, or 5.05 square miles per working day.

TOPOGRAPHY.

A preliminary survey of this portion of the river had been made during the season of 1879–'80, and the work of last season was intended to fill in the topographical details.

It was found, however, that in consequence of the loss of many of the triangulation stations and of the necessity of running shore lines to locate sounding stations and to determine changes in banks, bars, &c., that a complete survey was necessary. This work did not differ in detail from what had been done previous seasons. A sufficient number of triangulation stations were found to furnish azimuth, and to check stadia distances. Of the 100 triangulation stations on this portion of the river, 54 have been lost by caving of the banks, 2 have been taken away by persons unknown, 3 have been broken, and 2 were not found, although at safe distances from the river.

HYDROGRAPHY.

The instructions required that the sections sounded in 1879–'80 should be resounded as nearly as they could be identified. It was found, however, that, on account of changes that had taken place in banks, bars, islands, tow-heads, &c., the old sections could not be identified, and could be found only by plotting the shore-lines and comparing the two surveys. To have done this would have kept the hydrography far behind the other work, which it was not advisable to do. In the 101 miles of

main river 503 sections were sounded, making the average distance between them 323 meters. Probably none of the old sections would be more than 200 meters from one of the new ones, and the majority of them would be much less. It is probable that, on account of the changes that have taken place, the positions of the old sections relative to the general outline of the river had changed by as great distances, and that, therefore, the old sections have been as nearly duplicated as if sounded in exactly the same positions.

The following is a summary of the hydrographical work:

Miles of main river	101
Square miles	80
Sections in main river	503
Sections in chutes, &c	121
Soundings	29,283
Sextant angles	16,974

LEVELS.

Elevations were based upon a line of precise bench-marks, and are referred to the Memphis datum plane. There had been set originally 27 bench-marks, and of these 21 were found in good condition, 3 were not found but probably are safe, 1 had caved in the river, 1 had been broken, and 1 had been taken to serve as hearth-stone in a cabin near by.

The following table shows the discrepancies between the results of the precise levels and the ordinary levels:

Bench-marks.	Distance.	Discrepancy.	Bench-marks.	Distance.	Discrepancy.
	Miles.	*Feet.*		*Miles.*	*Feet.*
No. 27 to No. 28	3¾	−0.084	No. 42 to No. 43	½	+0.027
No. 28 to No. 31	14	−0.018	No. 43 to No. 44	2¾	−0.121
No. 28 to No. 32	17¼	+0.121	No. 44 to No. 45	1½	+0.098
No. 32 to No. 33	2	+0.118	No. 45 to No. 46	2	−0.052
No. 32 to No. 37	19¼	+0.097	No. 48 to No. 49	4	+0.070
No. 37 to No. 38	4¼	+0.011	No. 49 to No. 51	4	+0.062
No. 37 to No. 39	8¾	+0.063	No. 51 to No. 52*	3¼	−0.098
No. 39 to No. 41	9½	−0.078	No. 51 to No. 53	8¾	−0.146
No. 41 to No. 42	4	+0.008			

* No. 52 said to have been disturbed by a falling tree.

Lines of levels were run on each bank, the two checking each other by river crossings and by comparisons of water surfaces. The following table shows the discrepancies between the two lines of ordinary levels:

Locality of comparison.	Distance.	Discrepancy.	Locality of comparison.	Distance.	Discrepancy.
	Miles.	*Feet.*		*Miles.*	*Feet.*
Booth's Point, Tennessee.	7½	+0.357	Morgan's Point, Arkansas	9½	+0.030
Foot of Island 21	14	−0.111	Andrew's Landing, Arkansas	15	+0.037
Daniel's Point, Arkansas	20¾	+0.117	Brandywine Island	10½	+0.179
Elmot Landing, Arkansas	8½	−0.034			
Fulton, Tenn	14¼	−0.020			

There have been set along the section of the river 116 stone line bench-marks, of which 14 were set during last season. Of the 102 bench-marks set in 1879-'80 5 have been lost by caving of the banks, 3 have been broken, and 8 were not found, although at safe distances from the river. Filed herewith is a table showing all elevations of stone line bench-marks determined, and discrepancies where elevations have been obtained in both seasons for the same bench-marks. The elevations of bench-marks used in determining the low-water slope of 1883 were determined, and the water-gauges at Cottonwood Point and Fulton inspected, and the elevation of their zeros determined.

The assistants performed their duties with ability and energy, and to them is largely due the rapid progress of the work.

Very respectfully, your obedient servant,

L. L. WHEELER,
Assistant Engineer.

First Lieut. SMITH S. LEACH,
Secretary Mississippi River Commission.

APPENDIX D.

REPORT UPON AND RESULTS OF EXPERIMENTAL WORK AT VARIOUS DISCHARGE STATIONS.

OFFICE MISSISSIPPI RIVER COMMISSION,
Saint Louis, Mo., October 20, 1884.

GENERAL: I have the honor to submit herewith the results of the experimental work done at the Paducah, Columbus, Helena, Hays' Landing, and Red River Landing discharge stations in 1882. The work related mainly to the distribution of velocities throughout the cross-section.

The original reports are voluminous and contain much detail of computation not essential to a complete presentation of the results. The important parts have therefore been extracted; but it should be added that *every individual result* is presented in figures, and the individual curves omitted may easily be reconstructed from them by any one so inclined.

The methods of reduction are described in the report accompanying the Paducah results, and were the same for all the stations, all the computers working from one memorandum and under the same supervision. All the work was done with current meters.

There are given for each discharge section tables showing the ratings of meters used in determining velocities, and tables showing depths, velocities at each tenth of depth for each observation, means for each station, means of all stations, and means of all observations. For Paducah and Red River Landing there are given reports upon the reductions by Assistant Engineer E. H. Twining. A table is given showing transverse distribution of velocities observed at seven feet beneath the surface in the bend above Columbus. There are also given tables showing areas of a section in Beckwith's Bend, 12 miles below Columbus, and of a section in Brunette Bend, 22 miles below Red River Landing.

For each section a plate is given showing a sketch of the locality, the general shape of the cross-section and the vertical velocity curves. In order to economize space the origins of velocities in the curves have been so taken as to bring the curves as near each other as possible without confusion. The scales for velocities and depths are uniform throughout.

There is also given a plate showing the curves representing equal velocities at the Hays' Landing section at low water, the stage being between 6 and 7 feet. Each of the velocities there shown is the mean of 23 observations made on separate days, the river being practically at a stand.

While the curves of each station seem to have a different characteristic form, they are in close accord on one very important point in practical gauging, viz, the depth at which the mean velocity is to be found.

The following table shows the grand mean curve for all localities and the percentage of the depth at which mean velocity is found in the mean curve for each locality. This percentage varies from .60 to .71 only.

Very respectfully, your obedient servant,

SMITH S. LEACH,
First Lieutenant of Engineers, Secretary.

General C. B. COMSTOCK,
President Mississippi River Commission, and
Chairman Committee on Surveys and Examinations.

1.—PADUCAH, KENTUCKY.

OFFICE MISSISSIPPI RIVER COMMISSION,
Saint Louis, Mo., July 6, 1884.

SIR: In accordance with instructions, I have the honor to submit a report on the reduction of experimental work performed by Assistant W. G. Price, in the year 1882, at the Ohio River discharge section near Paducah, Ky.

The section is situated 3 miles below the mouth of the Tennessee River, and about 25 miles below the mouth of the Cumberland. The effect of local changes in these rivers is at times noticeable at the section, in producing irregularities both of amount

and distribution of velocities, especially at the lower stages. In general, however, a rise of these rivers is so nearly coincident with a like movement of the Ohio, that their effect is lost in the mass of the main river.

A middle bar, just showing at extreme low water, lies at about two-thirds the width of the river from the Kentucky shore. Nearly opposite the head of this, and nearer the Kentucky side, is the foot of a series of shoals, which are virtually a continuation of the point of land between the Ohio and Tennessee. Between these and the bar first mentioned is the high-water channel of the Ohio. The effect of this conformation will be alluded to in the course of the report.

A sketch of the locality is appended.

The experimental work included the following particulars: Determination of velocities in vertical planes; comparison of mid-depth and integration velocities; comparison of rod-float and meter velocities; current oscillations; meter ratings.

Vertical velocities.—These were all taken with the meter, Ellis No. 6 being used up to January 24, and Price A after that date. Observations were made at 17 stations, except from July 14 to August 31, when the number of stations was 16. These stations were located by fixed signals, so that the points of observation were nearly invariable. Only during the period above mentioned was it found necessary to redistribute the observations, in the process of combination. The meter was run for one minute at every foot in depth (in very shoal water at one-half foot intervals), and a mid-depth run of five minutes was made before and after each vertical. The whole number of verticals is 211.

The results are tabulated in the annexed sheets, numbered 1 to 84, with a graphic view of each vertical and of its location on the section. The meter registrations are given for one-minute runs, and the velocities in feet per second. Except where otherwise stated the scale of depth for the plotted curves is 10 feet, and that of velocity 1 foot to the division. In the location the scale is 1,000 feet to the division horizontal; the vertical scale is arbitrary.*

Upon the assumption that the velocities at proportionate depths, at all stations, maintain a fixed ratio, the vertical curves were divided into tenths, from surface to bottom, and the velocity at each tenth measured or computed, thus forming a new series of verticals of 11 points each. The verticals of this series were combined according to their respective stations, the mean of each group (station mean) representing the normal distribution of velocities in a vertical plane for that station. The station means were in like manner combined, the result (means of stations) giving the vertical distribution of velocities for the whole section. A grand mean was obtained by combining all the numbers of the series, without distributing them to their respective stations. This differs slightly from the mean of stations, from the fact that the number of observations was not the same for all stations, those made at the higher stages of water, not always including every station on the section.

Inspection of the curves on sheet No. 84 shows considerable variation in form, in passing from No. 1, on the Kentucky side, to No. 17, on the Illinois side, those on the left side of the middle bar having their maximum below, and those on the other side at the surface. In connection with the grand mean curve, the mean of stations 1 to 8, and that of stations 9 to 17, are exhibited. The difference in form arises from the fact that, as previously explained, the river at this point does not present a homogeneous section. Because of the disturbances from this source, it is hardly to be expected that the grand mean curves should be capable of being expressed by an equation. The nearest approach is apparently to that of an ellipse with its major axis vertical. Mr. Price is probably right in attributing some of these irregularities in the vertical distribution of velocities to differences in temperature of the two rivers, although, no record of the temperature of the water having been kept, the extent of this influence cannot be certainly defined. Aside from this, however, the variations in relative stage of the Ohio and its affluent affect to some extent the distribution of velocities, both vertical and transverse. Furthermore a change in transverse distribution also occurs as the absolute stage becomes lower, the maximum velocity above the 8-foot stage being on the Kentucky side, and below that stage on the Illinois side, except in case of a transient rise in the Tennessee. This apparently results from the action of the bar just above the section, which at low water tends to restrict the Ohio current to the north channel.

Mid-depth and integration velocities.—These experiments, 75 in number, were all made after the river had fallen to the 25-foot stage. The meter was run at mid-depth for five minutes, the registrations being noted at intervals of fifteen seconds; the integrations (taken from bottom to top only) were also recorded every fifteen seconds. Only mid-depth velocities were plotted, and the mean compared with that of the integrations. Inspection of the curves shows that the variations from the mean, with few exceptions, lie within the limits of error in observation, viz, a half second of time and

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* The tables here referred to are not published.

a half registration, and that there is little evidence of anything like rhythmic pulsation in the current during the time (five minutes) given to the observation.

The sum of the two errors mentioned gives an absolute error which may occur in any observation, and which will show a larger percentage as the velocity is lower. The mean of velocities observed at all stations for the period of this set of observations is 2.16 feet per second; the possible error is 0.14, or 6.5 per cent.

The average of all the observations gives a departure from the mean of ±6.5 per cent.; this however varies widely in the individual observations, ranging from 2 to 20 per cent. There are evidently, besides the errors of experiment, causes of fluctuation to be sought for in the irregularities of the stream lines and in the management of the meter. It is manifest that, if the meter is free to swing as a whole, like a pendulum, lateral variations will produce oscillations, which, interfering with the current movement, will give velocities varying from one another in the same way, and for the same reasons, as upward and downward integrations vary. These movements of the meter mask to some extent the current variations, and must be as far as possible eliminated before the latter can be examined. From the experiments on current oscillations at this station, it appears that lateral deviations are very small, and it would seem that the disturbing causes must be sought for in real changes of velocity, from instant to instant, at the point of measurement. An epicyclical movement of the particles of water, such as theoretical considerations would indicate, of course implies momentary changes in velocity at any given point. The extent of these and their regularity of recurrence can only be determined by means of an apparatus of continuous record, to avoid those sharp irregularities which must appear in any series of detached observations.

In order to compare roughly the fluctuations in mid-depth with those of the vertical velocities of the same period, a free-hand curve was drawn through each vertical, approaching as nearly as possible the form of the mean vertical curve of the section; the half sum of the extreme variations from this line was considered as the ± departure for that observation. The mean obtained in this way is 5 per cent., varying in individual cases from 2 to 15 per cent. of the mean velocity. In this case the time and registration errors have but one-fourth the weight of those in the mid-depth observations, since in the verticals the meter is recorded at one-minute intervals.

On the assumption that the errors of observation do not exceed the necesssary amount stated a half registration and a half second, these results indicate the action of a disturbing cause in the movements of the water. It is found, moreover, that the greatest fluctuations occur at the ends of the section, where the effect of the shore slope is felt. In the case of the verticals, it is not possible, in the absence of repeated observations at the same time, to decide how far the lowest observed velocity is affected by the bottom of the river, though the variety in form of the individual curves in this part points to a considerable range of variation in velocity.

The comparison of mid-depth and mean integration velocities shows that the former are about 3 per cent. in excess of the latter—a little more than this, if the mean of up and down integrations be taken, since the upward regularly exceeds the downward mean by 1 or 2 per cent. This agrees closely with the results of observations in vertical planes, in which the mean coefficient for the reduction of mid-depth to mean velocity is 0.965, varying, however, for the various stations from 0.944 to 1.000, and for the two sides of the river from 0.955 (stations 1 to 8) to 0.975 (stations 9 to 17), this difference between the two groups of stations proceeding from the relatively low surface velocity on the Kentucky side, as noticed above.

This coincidence incidentally confirms the correctness of the presupposition 0 on which most of the meter work on the Mississippi River and tributaries is based, viz, that the integrations furnish the true mean of velocities past a vertical.

Rod-float and meter velocities.—Rod floats were run in connection with the meter on twenty-four days, from June 7 to the end of the season; six floats were run at each station, and the mean taken. These velocities have been tabulated, but are not presented here, as the details add but little to the general results contianed in the tables of discharge observations, Report Mississippi River Commission 1883, pp. 185 ff. Plotted transverse curves of eight days' observations are, however, given on page 85, and ratios of meter to rod-float velocities on page 86.

In general, it will be seen that the velocities obtained by rod-floats are lower than indicated by the meter, for stages below 25 feet of the gauge. The few simultaneous observations made above this stage indicate that the rod-floats give at higher stages a slightly greater velocity than the meter, owing probably to the immersion. In the absence of slope data, no satisfactory comparison can be made of velocities observed from January 27 to February 10, when rod-floats alone were used, with those found later by the meter, at like stages. The mean ratio for stages from 3.23, to 10.40 is 0.946; from 3.23 to 20.88, 0.949; from 3.23 to 31.36, 0.963.

It was expected that comparisons could be made between the rod-float velocities and those found by the meter, at the same stage, down to the depth of immersion,

but it was found that changes in slope made this comparison very uncertain. On two days rods were run at varying depths, and at the same time vertical velocities taken with the meter, as follows:

Date.	Station.	Depth.	Immersion.	Velocity.		
				Rod-float.		Meter to immersion depth.
				Observed.	Reduced.	
1882.		*Feet.*	*Feet.*			
September 28	4	25	9.2	2.01	1.85	2.02
			16.1	1.98	1.87	2.01
			21.4	1.92	1.86	1.95
October 4	13	11.2	4.8	2.16	2.00	2.30
			9.2	2.10	2.02	2.22
October 4	14	11.0	4.8	2.33	2.15	2.33
			9.2	2.21	2.13	2.17
October 4	15	12.5	4.8	2.24	2.06	2.29
			9.2	2 17	2.07	2.19
November 1	16	10.8	4.2	1.45	1.34	
			9.2	1.36	1.32	

These results, so far as they go, show a tolerably close agreement of rod-float and meter, down to immersion depth; the coincidence also of the rod-float velocities reduced (by Francis formula) tends to verify this formula for large streams. It may be observed, moreover, that the velocities obtained by rods and meters respectively approximate more nearly if, in the case of the latter, account is taken of the fillet (in these observations 1 foot) of water next the bottom, not reached by the meter this having more weight in determining the mean velocity as the depth of water is less. From an estimate of the rate of decrease in velocity in approaching the bottom, based on the form of the mean-velocity curve, it would appear that the mean velocity of this fillet is not less than 85 per cent. of the velocity at 1 foot above the bottom.

Current oscillations.—Experiments were made to detect the occurrence of lateral deflections in the thread of the current at different points, by means of a submerged vane. These at first, when the whole apparatus was free to swing, indicated some oscillations; but when lateral guy lines were used to prevent this swinging, the deflections disappeared or were reduced to a very inconsiderable amount.

Meter ratings.—The meters rated were Ellis No. 6, Herschel No. 12, and Price A. A table of results is appended, as also the plotted ratings of meter A. The close correspondence of the different ratings of the last-named meter, and the absence of any important variations in its registering, show that it is to be relied on at all velocities.

Very respectfully, your obedient servant,

E. H. TWINING.

First Lieut. SMITH S. LEACH,
Secretary Mississippi River Commission.

Ratings of meters used at Paducah, Ky.

Locality.	Date.	Meter.	Number of observations.	Registrations per revolution.	*a*	*b*	Range of velocities per second.	Where taken.
	1882.						*Feet.*	
Paducah, Ky...	Feb. 23	Price A.....	15	2	0.027	0.511	2.04–5.88	In a pond.
Do.....	Mar. 4	....do	13	2	0.028	0.200	1.40–9.55	Do.
Do.....	Apr. 12	... do	13	2	0.0284	0.146	1.07–6.90	Do.
Do	Apr. 26	... do	8	2	0.0289	0.414	2.04–9.09	Do.
Do*.....	Apr. 26	... do	8	2	0.0282	0.152	1.52–9.09	Do.
Do.....	June 21	....do	10	2	0.0282	0.154	1.25–8.00	Do.
Do†.....	June 21	....do	11	2	0.03175	0.158	1.03–7.14	Do.
Do.....	July 26	....do	17	2	0.0317	0.154	0.98–7.13	Do.
Do.....	Sept. 27	....do	18	2	0.03165	0.159	0.79–6.76	Do.
Do.....	Feb. 4	Herschel No. 12	22	1	0.00748	0.011	1.39–9.15	Do.
	1881.							In reservoir.
Saint Louis, Mo	Nov. 8	Ellis No. 6	.....	1	0.0632	0.110	.....	In a pond.
	1882.							Do.
Paducah, Ky‡..	May 2	....do	6	1	0.056	0.205	2.30–8.00	
Do§.....	May 2	....do	5	1	0.0627	0.121	2.01–5.32	

* With new weight. † With new wheel. ‡ With weight. § Without weight.

Velocities in feet per second at each tenth of depth as resulting from the velocity observation made at Paducah, Ky., in 1882.

STATION 1.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
14	1.50	1.50	1.53	1.55	1.56	1.53	1.43	1.41	1.35	1.27	0.81
15	1.43	1.46	1.52	1.66	1.61	1.66	1.69	1.69	1.51	1.42	1.17
10	1.30	1.30	1.27	1.33	1.30	1.24	1.27	1.27	1.24	1.20	1.05
20	1.84	1.84	1.90	1.76	1.70	1.70	1.63	1.62	1.56	1.51	1.52
12	1.71	1.72	1.80	1.75	1.71	1.70	1.74	1.66	1.54	1.47	1.33
14	1.74	1.76	1.83	1.84	1.79	1.80	1.69	1.70	1.61	1.47	1.27
10	1.58	1.58	1.60	1.59	1.52	1.52	1.46	1.55	1.50	1.33	1.30
16	1.30	1.27	1.28	1.27	1.19	1.26	1.24	1.18	1.24	1.24	1.14
14	1.30	1.27	1.23	1.22	1.25	1.23	1.14	1.14	1.08	1.08	0.83
12	1.17	1.17	1.15	1.16	1.14	1.13	1.06	1.07	1.08	1.04	0.86
10	0.89	0.89	0.90	0.89	0.89	0.83	0.87	0.80	0.79	0.60	0.41
Means=13.4	1.43	1.43	1.46	1.46	1.43	1.42	1.38	1.37	1.32	1.24	1.06

STATION 2.

36	1.94	1.98	2.19	2.26	2.19	2.12	2.05	1.78	1.76	1.65	1.20
33	1.91	1.95	2.07	2.10	2.30	2.25	2.05	1.91	1.74	1.44	1.20
22	1.81	1.85	2.01	2.03	1.96	1.93	1.97	1.89	1.77	1.53	1.27
26	2.22	2.25	2.22	2.34	2.25	2.20	2.25	2.06	1.87	1.74	1.49
26	2.03	2.10	2.19	2.26	2.25	2.26	2.19	2.11	1.90	1.78	1.43
23	2.19	2.33	2.26	2.30	2.29	2.25	2.23	2.17	2.01	1.80	1.55
22	2.22	2.22	2.18	2.14	2.07	2.04	2.03	2.00	1.89	1.77	1.46
20	1.90	1.90	1.90	1.87	1.86	1.75	1.89	1.72	1.56	1.43	1.17
19	1.71	1.73	1.78	1.75	1.71	1.71	1.62	1.66	1.58	1.33	1.11
19	1.58	1.58	1.60	1.69	1.53	1.54	1.41	1.37	1.34	1.22	0.98
17	1.49	1.49	1.45	1.45	1.46	1.43	1.34	1.24	1.17	1.20	1.04
Means=23.9	1.91	1.94	1.99	2.02	1.99	1.96	1.89	1.81	1.69	1.54	1.26

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 3.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
57	4.10	4.21	4.32	4.35	4.16	4.07	3.92	3.67	3.39	2.78	2.16
37	2.05	2.22	2.37	2.47	2.45	2.30	2.35	2.26	2.07	1.91	1.37
36	2.41	2.28	2.38	2.32	2.35	2.44	2.41	2.11	2.06	1.91	1.20
25	2.25	2.25	2.03	2.02	1.84	1.98	2.00	1.90	1.58	1.50	1.36
30	2.53	2.66	2.60	2.66	2.75	2.66	2.53	2.34	2.15	2.00	1.71
30	2.44	2.52	2.53	2.57	2.57	2.57	2.52	2.37	2.28	2.27	1.74
27	2.63	2.54	2.60	2.60	2.47	2.47	2.27	2.38	2.15	1.93	1.65
26	2.37	2.30	2.34	2.39	2.41	2.24	2.28	2.17	2.09	1.98	1.71
27	2.57	2.60	2.50	2.53	2.36	2.41	2.37	2.17	2.20	1.94	1.71
23	1.80	2.03	1.97	1.97	2.02	1.90	1.81	1.75	1.69	1.61	1.30
22	1.71	1.65	1.65	1.65	1.64	1.66	1.57	1.52	1.42	1.34	1.11
22	1.65	1.65	1.75	1.72	1.74	1.54	1.49	1.46	1.36	1.37	1.11
Means=30.2	2.38	2.41	2.42	2.44	2.40	2.35	2.29	2.18	2.04	1.88	1.51

STATION 4.

72	6.25	6.30	6.56	5.72	5.91	5.80	6.00	5.27	5.33	5.46	2.81
70	4.58	5.48	4.89	5.32	5.00	5.03	5.00	4.08	4.63	3.16	1.64
43	2.66	2.70	2.60	2.72	2.67	2.78	2.77	2.63	2.48	2.08	1.58
42	2.35	2.33	2.31	2.47	2.48	2.58	2.54	2.35	2.09	2.01	1.53
37	2.70	2.45	2.48	2.53	2.48	2.51	2.65	2.58	2.39	2.19	1.59
27	2.09	2.00	2.17	1.93	2.01	2.00	1.90	1.77	1.76	1.61	1.43
31	2.91	2.85	2.85	2.95	2.95	2.98	2.91	2.69	2.53	2.15	1.90
30	2.57	2.74	2.79	2.79	2.82	2.82	2.84	2.68	2.43	2.27	1.74
25	2.19	2.05	2.20	2.02	2.04	1.96	1.93	1.83	1.73	1.56	1.49
27	2.44	2.41	2.51	2.20	2.30	2.22	2.21	2.06	2.00	1.75	1.49
27	2.41	2.37	2.62	2.52	2.46	2.42	2.36	2.18	2.41	1.93	1.44
25	2.03	2.10	2.07	1.90	2.00	2.01	1.98	1.93	1.78	1.64	1.46
24	1.84	1.86	1.89	1.98	1.84	1.84	1.92	1.89	1.68	1.64	1.33
23	1.80	1.81	1.89	1.80	1.76	1.84	1.86	1.77	1.67	1.50	1.36
22	1.84	1.86	1.74	1.74	1.68	1.63	1 56	1.46	1.36	1.36	0.86
Means=35.0	2.71	2.75	2.77	2.70	2.69	2.69	2.70	2.48	2.42	2.15	1.58

STATION 5.

56	5.13	4.95	5.04	5.03	4.98	4.69	4.56	4.41	3.99	3.65	3.04
40	2.38	2.55	2.72	2.66	2.75	2.78	2.75	2.52	2.38	2.22	1.68
36	2.86	2.67	2.61	2.65	2.65	2.86	2.88	2.76	2.68	2.17	1.78
25	2.37	2.18	2.03	2.16	2.12	2.14	2.19	2.06	1.81	1.50	1.20
31	3.04	2.98	3.07	3.07	3.07	3.13	2.98	2.91	2.63	2.34	1.93
28	2.75	2.73	2.73	2.79	2.84	2.85	2.71	2.65	2.46	2.40	1.87
25	2.15	2.05	2.06	2.08	2.18	2.03	2.04	2.11	1.82	1.74	1.49
26	2.50	2.48	2.34	2.44	2.44	2.34	2.37	2.26	2.12	2.00	1.46
27	2.60	2.43	2.50	2.57	2.34	2.35	2.30	2.24	2.23	1.90	1.58
24	2.19	2.14	1.93	1.87	2.03	1.86	1.84	1.85	1.90	1 72	1.39
23	1.87	1.84	1.87	1.87	1.83	1.84	1.75	1.74	1.64	1.45	1.42
20	1.68	1.68	1.69	1.68	1.67	1.64	1.56	1.48	1.41	1.30	0.63
Means=30.1	2.63	2.56	2.55	2.57	2.58	2 54	2.49	2.42	2.26	2.03	1.62

STATION 6.

66	4.88	5.95	5.55	5.70	5.45	5.78	5.13	5.13	4.56	4.26	3.41
40	2.16	2.24	2.41	2.41	2.52	2.69	2.94	2.80	2.66	2.38	1.96
34	2.69	2.65	2.64	2.66	2.78	2.86	2.86	2.61	2.47	2.05	1,90
24	1.84	2.12	2.20	2.06	1.97	2.10	1.96	1.79	1.68	1.54	1.43
28	3.07	3.01	3.02	3.01	3.04	2.87	2.72	2.60	2.60	2 34	2.03
26	2.82	2.80	2.79	2.68	2.72	2.62	2.53	2.42	2.34	2.26	1.96
23	2.12	2.07	2.00	1.98	1.91	2.00	1.92	1.88	1.78	1.59	1.58
23	2.28	2.26	2.17	2.27	2.24	1.96	1.93	1.92	1.86	1.70	1.55
24	2.50	2.47	2.44	2.32	2.28	2.33	2.13	2.07	2.00	2.06	1.58
21	1.93	1.96	1.87	1.87	1.77	1.77	1.68	1.68	1.58	1.58	1.30
20	1.62	1.62	1.62	1.55	1.58	1.52	1.46	1.49	1.33	1.33	1.20
20	1.52	1.49	1.49	1.39	1.37	1.41	1.37	1.41	1.26	1.15	1.08
20	1.71	1.65	1.62	1.62	1.55	1.55	1.50	1.31	1.31	1.38	1.17
Means=28.4	2.41	2.48	2.45	2.42	2.40	2.42	2.32	2.24	2.11	1.97	1.70

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 7.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
63	5.18	5.51	5.70	5.76	5.17	5.97	5.94	5.73	4.53	3.87	3.20
52	5.35	5.00	5.02	5.00	4.63	4.69	4.86	4.00	4.23	3.89	2.48
39	2.58	2.55	2.61	2.58	2.62	2.80	2.78	2.75	2.74	2.28	2.13
27	2.53	2.72	2.82	2.81	2.92	2.88	2.79	2.62	2.52	2.40	1.96
17	2.00	2.00	1.92	1.98	1.94	1.96	1.88	1.78	1.71	1.59	1.55
20	2.79	2.72	2.69	2.63	2.57	2.47	2.47	2.44	2.31	2.25	1.90
17	2.25	2.22	2.08	2.10	2.05	2.05	1.95	1.92	1.83	1.67	1.49
14	1.87	1.88	1.88	1.90	1.80	1.68	1.73	1.74	1.66	1.48	1.49
15	2.09	2.08	2.06	1.94	1.94	1.90	1.89	1.88	1.85	1.67	1.36
16	2.25	2.25	2.15	2.10	2.19	2.03	2.00	1.90	2.00	1.71	1.65
14	1.80	1.83	1.86	1.75	1.71	1.73	1.75	1.60	1.46	1.36	1.27
14	1.46	1.44	1.37	1.33	1.33	1.35	1.31	1.23	1.18	1.01	1.17
11	1.14	1.14	1.14	1.11	1.08	1.11	0.98	0.98	1.01	0.95	0.89
14	1.37	1.37	1.31	1.35	1.37	1.33	1.31	1.27	1.24	1.18	1.11
Means=23.8	2.48	2.48	2.47	2.45	2.38	2.42	2.40	2.27	2.16	1.95	1.69

STATION 8.

23	3.05	3.05	3.00	2.95	2.85	2.80	2.62	2.72	2.49	2.26	2.10
31	2.69	2.72	2.72	2.78	2.83	2.97	3.08	2.89	2.72	2.58	2.38
21	2.88	2.91	2.91	2.85	2.75	2.60	2.53	2.44	2.47	2.15	1.87
10	1.96	1.96	1.89	1.87	1.92	1.90	1.89	1.97	1.97	1.83	1.74
15	2.72	2.69	2.60	2.46	2.35	2.49	2.52	2.31	2.43	2.26	1.87
10	2.12	2.12	2.10	2.06	2.05	2.06	2.09	2.00	1.88	1.85	1.68
9	2.19	2.08	2.03	2.04	2.03	1.96	1.93	1.92	1.70	1.58	1.58
10	2.19	2.19	2.13	2.09	1.96	2.12	2.00	2.07	1.89	1.95	1.58
10	2.25	2.25	2.22	2.25	2.09	2.22	2.22	2.06	1.87	1.93	1.90
8	1.93	1.93	1.95	1.94	1.95	1.86	1.92	1.79	1.78	1.70	1.55
7	1.39	1.39	1.38	1.36	1.36	1.34	1.34	1.30	1.23	1.37	1.11
6	1.14	1.14	1.14	1.14	1.14	1.04	1.01	1.01	0.89	0.86	0.86
8	1.42	1.43	1.42	1.34	1.37	1.36	1.26	1.23	1.15	1.13	1.01
Means=13.0	2.15	2.14	2.11	2.09	2.05	2.06	2.02	1.98	1.88	1.80	1.63

STATION 9.

62	5.29	5.41	5.02	5.09	5.00	4.74	5.04	4.60	4.10	4.12	2.76
37	4.70	4.71	4.59	4.56	4.47	4.42	4.02	3.63	3.57	3.30	2.50
25	2.89	2.80	2.83	2.63	2.60	2.63	2.57	2.25	2.22	1.96	1.76
27	3.40	3.38	3.40	3.10	2 96	2.83	2.69	2.49	2.34	2.30	2.06
21	2.98	2.88	2.85	2.85	2.60	2.63	2.44	2.41	2.12	2.19	2.03
10	2.03	2.03	2 03	2.03	2.00	2.03	1.93	1.93	1.68	1.81	1.61
14	2.75	2.68	2.69	2.58	2.58	2.53	2.36	2.29	2.25	2.23	2.09
10	2.15	2.15	2.12	2.07	2.18	2.06	2.13	1.90	1.91	1.77	1.90
9	2.09	2.09	2.06	2.06	2.01	1.93	1.81	1.92	1.75	1.72	1.30
9	2.15	2.15	2.11	2.13	2.18	2.12	2.08	2.09	1.97	1.92	1.77
10	2.34	2.34	2.24	2.24	2.14	2.06	2.02	1.95	1.94	1.92	1.61
8	2.00	2.00	2.01	1.94	1.90	1.86	1.80	1.73	1.70	1.54	1.49
6	1.49	1.49	1.48	1.42	1.42	1.42	1.41	1.35	1.33	1.26	1.11
5	1.33	1.33	1.33	1.32	1.29	1.27	1.19	1.15	1.15	1.14	1.01
7	1.49	1.49	1.52	1.46	1.39	1.33	1.36	1.36	1.36	1.20	1.17
Means=17.3	2.60	2.60	2.55	2.50	2.45	2.39	2.32	2.20	2.09	2.02	1.74

STATION 10.

27	3.62	3.38	3.25	3.13	2.98	2.83	2.60	2.64	2.35	2.12	1.91
22	3.01	2.95	2.84	2.74	2.66	2.53	2.55	2.32	2.32	2.12	1.84
12	2.03	2.03	2.01	1.98	2.03	1.96	1.98	1.90	1.78	1.77	1.65
11	2.15	2.16	2.14	2.14	2.10	2.16	2.07	1.95	1.86	1.78	1.58
10	2.12	2.12	2.12	2.02	1.88	2.00	1.93	1.99	1.90	1.73	1.81
10	2.19	2.19	2.21	2.17	2.02	2.06	2.03	1.87	1.91	1.75	1.68
11	2.34	2.34	2.28	2.06	2.15	2.19	2.15	2.09	1.90	1.81	1.74
9	2.03	2.03	2.08	2.09	2.00	2.00	1.90	1.85	1.84	1.76	1.68
7	1.52	1.52	1.53	1.57	1.55	1.55	1.51	1.45	1.38	1.29	1.14
6	1.30	1.30	1.30	1.27	1.23	1.17	1.22	1.18	1.12	1.07	1.04
7	1.68	1.66	1.64	1.59	1.48	1.52	1.45	1.45	1.38	1.31	1.11
Means=12.0	2.18	2.15	2.13	2.07	2.01	2.00	1.94	1.88	1.79	1.68	1.56

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 11.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
28	3.52	3.37	8.26	3.18	3.03	2.91	2.75	2.55	2.36	2.16	1.81
20	2.69	2.69	2.64	2.64	2.57	2.48	2.39	2.22	2.22	2.20	1.81
12	2 09	2.09	2.08	2.03	2.03	2.03	1.97	1.89	1.85	1.78	1.68
16	2.66	2.72	2.75	2.68	2.85	2.68	2.69	2.52	2.41	2.38	2.19
12	2.41	2.40	2.30	2.33	2.29	2.15	2.18	2.20	1.94	2.06	1.71
11	2.34	2.34	2.31	2.31	2.15	2.25	2.19	2.15	1.96	1.93	1.87
11	2.15	2.15	2.12	2.09	2.25	2.12	2.09	1.93	1.84	1.96	1.81
12	2.41	2.40	2.33	2.31	2.28	2.20	2.23	2.04	1.91	1.90	1.74
10	2.19	2.19	2.11	2.09	2.00	2.06	2.03	1.90	1.93	1.89	1.58
8	1 71	1.71	1.69	1.58	1.62	1.57	1.57	1.59	1.49	1.45	1.27
7	1.39	1.39	1.40	1.33	1.34	1.34	1.25	1.18	1.19	1.17	1.01
8	1.74	1.75	1.75	1.59	1.69	1.65	1.69	1.60	1.43	1.38	1.33
Means=12.9	2.28	2.27	2.23	2.18	2.17	2.12	2.09	1.98	1.88	1.85	1.65

STATION 12.

41	4.65	4.50	4.50	4.48	4.27	3.84	3.91	3.79	3.58	3.16	2.28
28	2.78	2.73	2.71	2.51	2.61	2.46	2.33	2 16	2.06	1.90	1.68
29	3.30	3.24	3.07	2.89	2.73	2.61	2.48	2.39	2.23	2.03	1.69
17	3.17	3.13	3.06	3.07	2.98	2.91	2.89	2.72	2.62	2.53	2.19
13	2.37	2.37	2.41	2.38	2.30	2.28	2.23	2.16	2.00	2.05	1.90
12	2.50	2.50	2.44	2.47	2.34	2.12	2.03	2.15	2.00	2.09	1.77
12	2.21	2.32	2.37	2.28	2.21	2.15	2.20	2.15	2.06	1.92	1.87
14	2.60	2.61	2.50	2.46	2.51	2.42	2.33	2.34	2.13	2.02	1.90
11	2 22	2.22	2.22	2.28	2.25	2.22	2.12	1.96	2.03	1.84	1.77
9	1.71	1.71	1.79	1.75	1.72	1.58	1.64	1.64	1.58	1.37	1.49
8	1.55	1.51	1.54	1.41	1.36	1.36	1.42	1.36	1.37	1.22	1.20
9	1.90	1.90	1.87	1.78	1.68	1.62	1.68	1.58	1.62	1.52	1.49
Means=16.9	2.59	2.56	2.54	2.48	2.40	2.30	2.26	2.20	2.11	1.97	1.76

STATION 13.

32	3.47	3.40	3.48	3.42	3.19	3.27	3.14	2.99	2.70	2.67	2.43
31	3.24	3.18	2.99	2.83	2.70	2.51	2.41	2.19	2.06	1.81	1.37
21	2.79	2.75	2.75	2.69	2.66	2.57	2.50	2.37	2.15	2.12	1.74
14	2.28	2.25	2.19	2.15	2.13	2.06	2.07	2.06	2.00	1.96	1.71
14	2.69	2.67	2.70	2.63	2.55	2.60	2.57	2.45	2.26	2.15	2.09
13	2.37	2.38	2.36	2.35	2.32	2.22	2.20	2.15	2.00	1.82	1.20
14	2.75	2.72	2.56	2.59	2.59	2.47	2.46	2.36	2.21	2.08	1.68
11	2.31	2.31	2.34	2.34	2.28	2.25	2.31	2.09	2.12	1.93	1.80
9	1.90	1.90	1.84	1.87	1.78	1.72	1.71	1.62	1.58	1.46	1.49
9	1.55	1.52	1.49	1.49	1.42	1.50	1.39	1.28	1.17	1.24	1.30
10	1.93	1.93	1.93	1.87	1.83	1.90	1.79	1.78	1.74	1.56	1.74
Means=16.2	2.48	2.46	2.42	2.38	2.31	2.28	2.23	2.12	2.00	1.89	1.69

STATION 14.

42	4.19	4.18	4.15	3.87	3.96	3.85	3.40	3.64	3.30	2.31	1.85
31	3.24	3.14	2.96	2.73	2.70	2.57	2.32	2.32	2.09	1.81	0.96
21	2.91	2.95	2.82	2.79	2.66	2.57	2.47	2.34	2.15	1.90	1.61
14	2.34	2.35	2.32	2.25	2.16	2.15	2.13	2.09	1.94	1.81	1.71
14	2.31	2.31	2.27	2.25	2.22	2.12	2.05	2.02	1.92	1.76	1.77
13	2.85	2.83	2.73	2.64	2.60	2.58	2.49	2.47	2.35	2.17	1.93
12	2.41	2.39	2.27	2.33	2.32	2.31	2.32	2.16	2.02	1.86	1.81
13	2.66	2.67	2.60	2.53	2.54	2.44	2.35	2.36	2.39	2.22	2.03
14	2.63	2.60	2.49	2.52	2.54	2.52	2.44	2.29	2.07	1.94	1.77
11	2.50	2.50	2.44	2.31	2.22	2.19	2.19	1.96	1.93	1.77	1.77
10	2.03	2.03	2.00	1.99	1.93	2.00	1.87	1.85	1.88	1.78	1.58
8	1.55	1.56	1.61	1.53	1.50	1.42	1.47	1.41	1.45	1.34	1.14
Means=16.9	2.64	2.63	2.56	2.48	2.45	2.39	2.29	2.26	2.12	1.89	1.66

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 15.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
57	4.99	4.93	4.50	4.86	5.10	4.57	4.65	4.42	3.79	3.63	**2.86**
33	2.96	2.86	2.76	2.77	2.72	2.61	2.43	2.19	2.02	1.80	**1.30**
22	2.53	2.61	2.49	2.43	2.33	2.25	2.14	1.85	1.85	1.59	**1.11**
16	2.19	2.16	2.09	2.04	1.96	2.01	1.93	1.88	1.81	1.70	**1.58**
15	2.66	2.64	2.57	2.50	2.44	2.42	2.41	2.20	2.12	1.94	**1.84**
14	2.37	2.36	2.28	2.28	2.21	2.26	2.23	2.20	1.19	2.04	**1.87**
15	2.66	2 64	2.64	2.49	2.41	2.44	2.44	2.42	2.25	2.22	**1.61**
16	2.66	2.63	2.63	2.64	2.63	2.55	2.53	2.42	1.41	2.05	**2.06**
15	2.63	2.62	2.60	2.51	2.36	2.34	2 35	2.33	2.22	2.05	**1.81**
12	2.41	2.40	2.32	2.24	2.24	2.16	2.08	2.02	1.94	1.93	**1.74**
11	1.87	1.87	1.93	1.87	1.87	1.93	1.77	1.74	1.74	1.49	**1.30**
10	1.58	1.58	1.61	1.61	1.57	1.39	1.46	1.47	1.47	1.34	**1.27**
11	2.06	2.06	2.04	2.09	2.07	2.03	1.93	1.75	1.77	1.79	**1.62**
Means=19.0	2.58	2.57	2.49	2.49	2.45	2.38	2.33	2.22	2.12	1.97	**1.69**

STATION 16.

35	3.18	3.03	2.88	2.62	2.55	2.38	2.22	2.02	1.94	1.58	**1.08**
25	2.31	2 30	2 29	2.21	2.13	2.03	1.92	1.84	1.71	1.42	**1.17**
19	1.96	1.90	1.89	1.83	1.78	1.77	1.69	1.65	1.54	1.47	**1.24**
21	2.72	2.75	2.69	2.60	2.60	2.57	2.37	2.31	2.15	2.03	**1.71**
18	1.96	1.99	1.94	1.96	1.97	1.90	1.70	1.74	1.58	1.40	**1.24**
18	2.22	2.20	2 20	2.21	2.08	2.14	1.99	1.90	1.79	1.60	**1.52**
18	2.44	2 37	2.33	2.34	2.24	2.20	2.08	2.06	1.92	1.82	**1.43**
18	2.25	2.25	2.13	2.18	2.10	2.02	1.97	1.84	1.73	1.67	**1.36**
15	2.12	2.11	2.04	2.03	1.90	1.93	1.91	1.80	1.73	1.58	**1.42**
13	1.77	1.77	1.74	1.72	1.68	1.68	1.65	1.54	1.44	1.35	**1.20**
12	1.49	1.48	1.38	1.37	1.38	1.32	1 31	1.27	1.18	1.12	**1.01**
12	1.80	1.86	1.73	1.81	1.71	1.90	1.82	1.62	1.46	1.65	**1.42**
Means=18.7	2.18	2.17	2.10	2.07	2.01	1.99	1.89	1.80	1.68	1.56	**1.32**

STATION 17.

53	3.59	3.40	3.84	3.90	3.40	3.28	3.10	3.01	2.44	1.80	**1.21**
33	2.57	2.53	2.26	2.08	1.92	1.75	1.60	1.40	1.39	1.27	**1.05**
24	1.99	1.83	1.86	1.72	1.75	1.66	1.52	1.40	1.34	1.25	**0.89**
20	1.68	1.68	1.53	1.41	1.45	1.38	1.26	1.23	1.41	1.33	**1.14**
23	2.47	2.42	2.28	2.27	2.12	2.14	2.02	1.96	2.09	1.98	**1 46**
15	1.17	1.22	1.30	1.28	1.32	1.27	1.24	1.32	1.24	1.09	**0.86**
19	1.93	1.88	1.90	2.00	1.85	1.96	1.94	1.79	1.71	1.62	**1.55**
16	1.81	1.87	1.86	1.93	1.89	1.77	1.75	1.65	1.50	1.29	**0.89**
15	1.74	1.69	1.58	1.70	1.60	1.56	1.37	1.31	1.19	1.24	**1.01**
14	1.42	1.45	1.53	1 43	1.37	1.25	1.19	1.12	1.08	1.06	**0.79**
12	0.95	0.96	1.05	1.09	1.10	1.14	1.02	0.90	0.77	0.84	**0.76**
14	1.71	1.69	1.57	1.66	1.60	1 52	1.45	1.41	1.40	1.22	**1.24**
Means=21.5	1.92	1.88	1.88	1.87	1.78	1.72	1.62	1.54	1.46	1.33	**1.07**

MEAN VALUES OF STATION MEANS.

Station No.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
1	1.43	1.43	1.46	1.46	1.43	1.42	1.38	1.31	1.32	1.24	**1.06**
2	1.91	1.94	1.99	2.02	1.99	1.96	1.89	1.81	1.69	1.54	**1.26**
3	2.38	2.41	2.42	2.44	2.40	2.35	2.29	2.18	2.04	1.88	**1.51**
4	2.71	2.75	2.77	2.70	2.69	2.69	2.70	2.48	2.42	2.15	**1.58**
5	2.63	2.56	2.55	2.57	2.58	2.54	2.49	2.42	2.26	2.03	**1.62**
6	2.41	2.48	2.45	2.42	2.40	2.42	2.32	2.24	2.11	1.97	**1.70**
7	2.48	2.48	2.47	2.45	2.38	2.42	2.40	2.27	2.16	1.95	**1.69**
8	2.15	2.14	2.11	2.09	2.05	2.06	2.03	1.98	1.88	1.80	**1.63**
9	2.60	2.60	2.55	2.50	2.45	2 39	2.32	2.20	2.09	2.02	**1.74**
10	2.18	2.15	2.13	2.07	2.01	2.00	1.94	1.88	1.79	1.68	**1.56**
11	2.28	2.27	2.23	2.18	2.17	2.12	2.09	1.98	1.88	1.85	**1.65**
12	2.59	2.56	2.54	2.48	2.40	2.30	2 26	2.20	2.11	1.97	**1.76**
13	2.48	2.46	2.42	2.38	2.31	2.28	2.23	2.12	2.00	1.89	**1.69**
14	2.64	2.63	2.56	2.48	2.45	2.39	2.29	2.26	2.12	1.89	**1.66**
15	2.58	2.57	2.49	2.49	2.45	2.38	2.33	2.22	2.12	1.97	**1.69**
16	2.18	2.17	2.10	2.07	2.01	1.99	1.89	1.80	1.68	1.56	**1.32**
17	1.92	1.88	1.88	1.87	1.78	1.72	1.62	1.54	1.46	1.33	**1.07**
Means=	2.33	2.32	2.30	2.27	2.23	2.20	2.15	2.06	1.95	1.81	**1.54**

Velocities in feet per second at each tenth of depth, &c.—Continued.

MEAN VALUES OF ALL OBSERVATIONS.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
	2.34	2.34	2.32	2.29	2.25	2.22	2.17	2.07	1.97	1.84	1.55

2.—Columbus, Kentucky.

Ratings of meters used at Columbus, Ky.

Locality.	Date.	Meter.	Number of observations.	Registrations per revolution.	*a.*	*b.*	Range of velocities per second.	Where taken.
	1881.						*Feet.*	
Saint Louis	Nov. 14	3	23	1	0.0639	0.2578	2.140— 8.520	Reservoir, Saint Louis.
	1882.							
Columbus, Ky	Mar. 17	23	15	1	0.0604	0.333	1.980— 6.897	In backwater.
Do	Apr. 3	23	14	1	0.0647	0.416	3.333— 9.091	Do.
Do	Apr. 20	3	14	1	0.0574	0.795	3.297—11.111	In a lake.
Do	May 17	3	17	1	0.0634	0.425	1.734—10.000	In a small pond.
Do*	May 23	23	13	1	0.0635	0.4074	2.973—10.345	In a lake.
Do*	June 19	23	13	1	0.0634	0.2591	2.586—10.310	Do.
Do	July 11	23	21	1	0.0634	0.2843	1.154—10.000	Do.
Do	July 19	6	38	1	0.0605	0.2973	0.739—10.345	Do.
Do	Aug. 9	23	24	1	0.0596	0.2689	0.826— 8.000	Do.
Do	Aug. 23	23	20	1	0.0591	0.2798	1.176— 8.000	Do.
Do†	Sept. 6	23	14	1	0.0605	0.3323	1.031— 6.667	Do.
Do‡	Sept. 6	6	13	1	0.0572	0.2611	1.333— 6.452	Do.
Do	Sept. 19	6	20	1	0.0597	0.2148	0.699— 8.696	Do.
Do	Sept. 19	23	21	1	0.0610	0.2884	0.877— 8.333	Do.
Do	Oct. 14	6	15	1	0.0593	0.3604	0.990— 8.333	Do.
Do	Oct. 30	6	16	1	0.0591	0.4137	1.000— 8.696	Do.
Do	Nov. 20	6	10	1	0.0646	0.3010	1.149— 8.009	Do.

* With block. † Meter in bad condition. ‡ Meter in good condition.

Velocities in feet per second at each tenth of depth as resulting from the velocity observations made at Columbus, Ky., in 1882.

STATION 1.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
63.0	0.868	1.163	1.506	1.589	1.610	1.631	1.620	1.558	1.374	1.055	0.868

STATION 2.

62.0	3.329	3.508	3.422	3.306	3.680	3.370	3.720	3.320	3.066	2.900	2.376
52.0	2.350	2.453	2.476	2.565	2.675	2.790	2.640	2.150	1.825	1.725	1.590
47.5	2.182	2.500	2.630	2.680	2.680	2.585	2.495	2.410	2.184	1.830	1.525
38.0	1.360	1.515	1.585	1.550	1.575	1.603	1.590	1.470	1.320	1.100	0.757
34.0	0.895	1.200	1.350	1.430	1.489	1.667	1.546	1.426	1.300	1.150	0.955
Means=46.6	2.023	2.235	2.293	2.306	2.420	2.403	2.398	2.155	1.939	1.741	1.441

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 3.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
72.0	4.231	4.977	5 020	5.225	5.160	5.268	4.870	4.575	4.752	4.050	3.843
69.5	4.472	4.978	4 820	4.785	4.860	4.914	4.780	4.663	4.475	3.745	3.329
68.0	4.663	5.060	5.010	5.020	5.065	4.979	4.872	4.575	4.775	4.180	3.329
70.0	3.771	4.630	4.979	5.040	4.914	4.914	4.971	4.853	4.390	4.080	3.519
66.5	3.836	4.490	4.663	4.626	4.598	4.480	4.310	4.200	4.025	4.090	3.138
62.0	3.301	4.030	4.210	4.126	4.075	3.953	3.718	3.640	3.240	2.450	2.225
62.0	3.329	4.120	4.380	4.570	4.720	4.630	4.535	4.520	4.250	3.700	3.645
66.0	4.090	4.300	4 185	4.630	4.970	4.700	4.471	4.290	4.325	3.500	2.884
59.0	2.823	3.394	3.535	3.727	3.760	3.709	3.825	3.820	3.520	3.070	2.313
62.0	3.454	3.660	4.216	4.425	4.370	4.475	4.400	4.030	3.730	3.175	2.823
51.5	2.512	2.630	2.740	2.845	2.950	2.975	2.830	2.662	2.660	2.335	1.643
42.0	1.759	1.840	1.910	1.936	1.936	1.975	1.940	1.840	1.699	1.365	1.049
36.0	0.770	1.080	1.310	1.320	1.425	1.368	1.380	1.420	1.325	1.150	1.012
34.0	1.416	1.550	1.550	1.575	1.550	1.440	1.450	1.390	1.285	1.175	1.122
Means=58.6	3.173	3.696	3.751	3.846	3.882	3.841	3.739	3.606	3.461	3.005	2.562

STATION 4.

73.0	4.491	4.960	5.240	5.225	5.173	5.150	4.860	4.410	4.680	3.780	3.715
74.0	4.297	4.960	5 310	5.140	5.225	5.074	4.990	4.750	4.760	4.345	3.393
65.0	3.740	4.370	4.538	4.575	4.640	4.440	4.475	4.330	4.040	3.300	3.112
66.0	3.594	4.484	4.410	4.335	4.475	4.419	4.280	4.140	4.025	3.800	2.962
69.0	3.658	4.510	4.575	4.740	4.690	4.730	4.500	3.900	3.733	3.467	3.404
66.5	3.849	4.630	4.575	4.770	4.865	4.950	4.860	4.470	3.860	3.460	2.453
73.0	4.355	5.330	5.790	5.825	5.820	5.500	5.590	5.390	4.960	4.600	4.294
68.0	3.901	4.789	5.010	5.227	5.090	4.853	4.730	4.325	4.216	4.025	3.455
65.0	3.301	4.130	4.430	4.600	4.631	4.506	4.320	4.000	3.873	3.150	2.540
68.0	3.555	4.920	4.777	4.757	4.930	4.930	4.880	4.740	4.150	3.770	3.491
70.0	4.535	4.977	5.020	5.000	5.410	5.325	5.357	5.045	4.725	4.550	3.900
63.0	3.454	3.970	4.375	4.330	4.330	4.380	4.150	3.860	3.770	2.375	2.313
57.0	1.884	2.570	2.700	2.820	2.880	2.775	2.675	2.580	2.525	2.000	1.227
53.0	2.114	2.465	2.575	2.630	2.646	2.610	2.475	2.320	2.085	1.830	1.638
45.0	1.980	2.220	2.270	2.055	2.120	2.240	2.172	2.025	1.825	1.430	1.142
Means=65.0	3 514	4.219	4.373	4.402	4.462	4.392	4.288	4.019	3.815	3.325	2.869

STATION 5.

75.0	4.229	4.660	4.895	4.864	5.100	5.000	4.868	4.674	4.660	4.075	3.723
75.0	5.742	6.490	6.225	6.123	5.655	5.780	5.660	4.789	4.155	5.290	4.407
69.0	4.661	4.880	5.125	5.075	5.250	4.880	5.125	4.920	4.520	4.470	4.090
69.0	4.025	4.520	4.725	5.010	4.920	4.770	4.630	4.345	4.190	4.120	3.394
63.0	3.084	2.925	3.075	3.215	3.225	3.000	2.550	2.530	1.890	*1.600	*1.400
50.0	1.936	2.180	2.180	2.250	2.325	2.290	2.180	2.040	1.880	1.640	1.344
55.0	1.647	2.350	2.350	2.210	2.275	2.245	2 245	2.225	2.020	1.875	1.350
49.0	1.607	1.725	1.840	1.670	1.765	1.724	1.715	1.590	1.489	1.300	1.073
47.0	1.948	2.070	2.278	2.230	2.090	2.125	2.140	2.068	1.825	1.425	1.005
Means=61.3	3.209	3.533	3.638	3.627	3.623	3.535	3.457	3.242	2.959	2.866	2.421

* Interpolated.

STATION 6.

65.0	2.720	3.380	3.325	3.355	3.324	3.250	2.970	2.980	2.740	2.375	2.052
60.0	1.876	2.375	2.408	2.525	2.470	2.585	2.560	2.260	1.995	1.725	1.585
62.5	2.037	2.360	2.550	2.425	2.380	2.270	2.380	2.170	2.175	1.875	1.693
64.0	2.066	2.600	2.565	2.660	2.685	2.640	2 520	2.535	2.290	1.995	1.708
51.5	1.845	1.820	1.845	1.670	1.740	1.728	1.650	1.607	1.450	1.220	1.073
Means=60.6	2.109	2.507	2.539	2.527	2.520	2.495	2.416	2.310	2.130	1.838	1.622

STATION 7.

66.0	3.084	3.320	3.580	3.560	3.567	3.530	3.425	3.150	3.300	2.770	2.176
64.0	2.231	2.702	2.702	2.725	2.785	2.823	2.725	2.550	2.680	2.025	1.585
63.0	1.887	2.275	2.600	2.450	2.660	2.542	2.525	2.350	2.275	2.030	1.708
57.0	1.887	1.980	1.950	1.995	2.005	1.950	1.830	1.770	1.720	1.540	1.049
53.0	1.489	1.600	1.783	1.760	1.785	1.718	1.667	1.667	1.570	1.100	0.895
58.0	1.714	1.950	2.008	2.008	2.090	2.110	2.060	1.955	1.868	1.627	1.183
Means=60.2	2.049	2.304	2.437	2.416	2.482	2.446	2.372	2.240	2.236	1.849	1.433

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 8.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
71.0	2.960	3.490	3.624	3.780	3.650	3.749	3.755	3.580	3.400	2.760	2.415
66.0	3.201	3.430	3.300	3.310	3.250	3.185	3.201	3.200	2.768	2.285	2.124
65.0	2.208	2.650	2.755	2.785	2.700	2.665	2.665	2.570	2.430	2.505	2.037
62 0	2.066	2.230	2.450	2.400	2.253	2.302	2.230	2.123	2.040	1.826	1.586
59.5	1.647	2.050	2.184	2.184	2.130	2.040	2.123	2.005	1.960	1.838	1.529
58.0	1.570	1.860	1.970	1.960	2.057	2.080	2.057	1.930	1.975	1.520	1.204
57.0	1.724	1.875	1.945	1.950	1.985	2.023	1.965	1.925	1.724	1.515	1.429
Means=62.6	2.197	2.512	2.604	2.624	2.575	2.578	2.571	2.476	2.328	2.036	1.761

STATION 9.

70.0	3.324	3.825	4.150	4.270	4.220	4.130	4.150	3.725	3.475	3.230	2.597
66.0	3.021	3.095	3.2.5	3.365	3.360	3.319	3.260	3.230	3.020	2.800	2.304
58.0	1.691	1.880	2.050	2.181	2.280	2.325	2.230	2.075	1.936	1.750	1.508
56.0	1.771	2.035	2.210	2.300	2.302	2.250	2.265	2.335	2.360	1.960	1.477
Means=62.5	2.452	2.709	2.909	3.029	3.041	3.006	2.976	2.841	2.698	2.435	1.972

STATION 10.

62.0	2.662	3 218	3.290	3.275	3.345	3.475	3 420	3.260	2.875	2.640	2.361
57.0	1.887	2.500	2.450	2.364	2.480	2.460	2.510	2.542	2.400	2.230	2.066
62.0	2.123	2.900	3.120	3 040	3.140	3.080	2.820	2.860	2.690	2.380	2.005
58 0	1.887	2.115	2.220	2.245	2.295	2.245	2.006	2.080	1.940	1.710	1.350
57.0	2.057	2.175	2.320	2.310	2.361	2.220	2.302	2.075	1.960	1.691	1.449
56.0	1.771	2.060	2.240	2.230	2.184	2.255	2.260	2.110	2.000	1.700	1.416
57.0	1.654	1.870	1.835	1.946	2.068	2.068	2.008	1.885	1.695	1.350	0.885
Means=58.4	2.006	2.405	2.496	2.487	2.554	2.543	2.475	2.402	2.223	1.957	1.647

STATION 11.

66.0	4.050	4.870	4.825	4.657	4.720	4.805	4.450	4.294	4.350	3.880	2.902
72.0	4.294	4.800	4.719	4.980	4.680	4.730	4.330	4.500	4.370	3.525	2.720
61.0	2.540	3.021	3.319	3.350	3.440	3.330	3.250	3.120	3.140	2.740	2.512
56.5	2.148	2.480	2.450	2.449	2.630	2.440	2.340	2.425	2.220	2.240	2.148
56.0	1.765	2.302	2.290	2 481	2.542	2.495	2.520	2.330	2.361	2.120	1.647
55.0	1.887	2.318	2.370	2.424	2.603	2.525	2.424	2.630	2.455	2.210	1.887
51.0	1.714	2.100	2.184	2.225	2.184	2.225	2.184	2.184	2.050	1.825	1.891
Means=59.6	2.628	3.127	3.165	3.224	3.256	3.221	3.071	3.069	2.992	2.649	2.244

STATION 12.

69.0	3.964	4.518	4.520	4 700	4.630	4.835	4.690	4.475	3.950	3.750	3.835
67.0	4.174	4 450	4.537	4.537	4.525	4.550	4.070	3.875	3.350	2.830	3.023
60.0	3.021	3 079	3.079	3.079	3.119	3.170	3.201	3.030	2.770	2.775	2.512
60.5	2.720	2.870	3.070	3.140	3.140	3.140	3.140	2.980	2.920	2.690	1.704
55.0	2.066	2.450	2.590	2.585	2.630	2.660	2.620	2.665	2.650	2.380	2.005
52 0	1.691	2.040	2.119	2.280	2.225	2.270	2.180	2 057	1.815	1.810	1.632
51.0	1.508	2.020	2.119	2.080	2.119	2.119	1.998	1.925	1.920	1.920	1.753
50.0	1.714	2.075	2.184	2.090	2.035	2.335	2.410	2 260	2.100	1.840	1.714
38.0	1.771	1.940	2.070	2.110	2.080	2.180	2.068	2.005	1.891	1.750	1.416
Means=55.8	2.514	2.827	2.921	2.956	2.945	3.029	2.931	2.808	2.596	2.416	2.177

STATION 13.

64.0	3.901	4.217	4.180	3.950	3.620	3.655	3.650	3.645	3.820	3.450	2.437
69.0	3.835	4.150	4.150	3.925	3.925	4.070	3.850	3.680	3.180	2.890	3.013
66.0	2.779	3.480	3.420	3.530	3.625	3.560	3.355	3.360	3.420	3.350	2.295
65.0	2.720	3.000	2.810	2.810	2.750	2.781	2.650	2.601	2.170	2.063	1.884
55.0	1.541	1.930	2.025	1.920	1.904	2.020	1.920	1.805	1.675	1.720	1.541
60.0	2.066	2.520	2.630	2.420	2.425	2.280	2 385	2.302	2.125	1.990	1.826
54.0	1.753	1.675	1.830	2.035	2.057	2.057	2.057	1.878	1.691	1.645	1.325
53.0	1.537	1.925	2.010	2.030	2.063	2.035	2.008	2.190	1.930	1.778	1.594
Means=60.8	2.517	2.862	2.882	2.828	2.796	2.807	2.734	2.683	2.503	2.361	1.969

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 14.

Depth.	Surface.	.1	2	.3	.4	.5	.6	.7	.8	.9	Bottom.
63.0	3.009	3.880	4.090	4.190	4.030	4.045	4.145	4.217	4.118	3.900	2.437
59.0	3.645	3.964	3.775	3.870	4.025	4.060	3.815	3.600	3.175	3.100	2.503
41.0	1.190	1.550	1.785	1.770	1.690	1.720	1.670	1.503	1.520	1.518	1.429
38.0	1.062	1.413	1.416	1.380	1.325	1.380	1.450	1.438	1.416	1.250	0.885
Means=50.2	2.227	2.702	2.767	2.803	2.768	2.801	2.770	2.700	2.557	2.442	1.814

MEAN VALUES OF STATION MEANS.

No. of station.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
1	0.868	1.163	1.506	1.589	1.610	1.631	1.620	1.558	1.374	1.055	0.868
2	2.023	2.235	2.293	2.306	2.420	2.403	2.398	2.155	1.939	1.741	1.441
3	3.173	3.696	3.751	3.846	3.882	3.841	3.739	3.606	3.461	3.005	2.562
4	3.514	4.219	4.373	4.402	4.462	4.392	4.288	4.019	3.815	3.325	2.869
5	3.209	3.533	3.633	3.257	3.623	3.535	3.457	3.242	2.959	2.866	2.421
6	2.109	2.507	2.539	2.527	2.520	2.495	2.416	2.310	2.130	1.838	1.622
7	2.049	2.304	2.437	2.416	2.482	2.446	2.372	2.240	2.236	1.849	1.433
8	2.197	2.512	2.604	2.624	2.575	2.578	2.571	2.476	2.328	2.036	1.761
9	2.452	2.709	2.909	3.029	3.041	3.006	2.976	2.841	2.698	2.435	1.972
10	2.006	2.405	2.496	2.487	2.554	2.543	2.475	2.402	2.223	1.957	1.647
11	2.628	3.127	3.165	3.224	3.256	3.221	3.071	3.069	2.992	2.649	2.244
12	2.514	2.827	2.921	2.956	2.945	3.029	2.931	2.808	2.596	2.416	2.177
13	2.517	2.862	2.882	2.828	2.796	2.807	2.734	2.683	2.503	2.361	1.981
14	2.227	2.702	2.767	2.803	2.768	2.801	2.770	2.700	2.557	2.442	1.814
Means =	2.392	2.772	2.877	2.905	2.924	2.909	2.844	2.722	2.558	2.284	1.916

MEAN VALUES OF ALL OBSERVATIONS.

Means =	2.665	3.077	3.178	3.205	3.227	3.204	3.126	2.988	2.818	2.519	2.136

Transverse velocities observed in bend above Columbus, Ky., at each twentieth of surface width 7 feet beneath surface.

	1882.								
	March 31.	April 28.	May 30.	June 30.	July 25.	September 11.	October 9.	November 15.	Means.
One-twentieth	.....	3.742	4.890	4.340	3.180	1.750	.....	1.600	3.250
Two-twentieths	5.920	4.220	5.290	4.610	3.370	2.160	1.450	1.745	3.596
Three-twentieths	6.080	4.280	5.420	4.850	3.625	2.217	1.620	1.984	3.760
Four-twentieths	6.191	4.560	5.550	5.240	3.680	2.180	1.753	2.140	3.912
Five-twentieths	6.260	4.680	5.690	5.220	3.825	2.425	1.920	2.340	4.045
Six-twentieths	6.280	4.750	5.775	5.300	4.225	2.550	2.175	2.650	4.213
Seven-twentieths	5.950	4.810	5.850	5.330	4.110	2.650	2.180	2.590	4.184
Eight-twentieths	5.384	4.730	5.680	5.178	4.217	2.690	2.440	2.720	4.130
Nine-twentieths	5.330	4.350	5.440	5.150	4.000	2.640	2.417	2.600	3.991
Ten-twentieths	5.350	4.230	5.280	5.080	3.816	2.680	2.260	2.700	3.925
Eleven-twentieths	5.425	4.285	5.000	4.760	3.890	2.532	1.938	2.440	3.784
Twelve-twentieths	5.550	4.375	5.230	4.700	3.760	2.370	1.730	2.400	3.764
Thirteen-twentieths	5.675	4.190	5.500	4.840	3.550	2.150	1.820	1.915	3.705
Fourteen-twentieths	5.750	4.420	4.850	4.820	3.500	2.250	1.835	2.345	3.709
Fifteen-twentieths	5.400	4.550	4.100	4.820	3.425	2.410	1.825	2.170	3.588
Sixteen-twentieths	4.675	4.650	3.160	3.470	3.700	2.050	1.600	1.938	3.155
Seventeen-twentieths	3.425	3.100	2.450	3.075	2.700	1.700	1.300	.....	2.536
Eighteen-twentieths	.....	.....	.....	2.452	1.750	.....	.....	.....	2.101
Nineteen-twentieths	.....	.....	.....	.....	.....	.....	.....	.....	.....

Areas in Beckwith's Bend.

[Datum areas computed with gauge readings at Columbus, Ky.]

Date.	Gauge.	Width.	Area.	+ Scour. — Fill.	Datum area.
	Feet.	*Feet.*	*Sq. feet.*	*Sq. feet.*	*Sq. feet.*
May 24	96.395	6,207.8	218,169	.....	218,169
June 24	93.432	6,180.7	204,417	+ 4,602	222,771
July 17	88.236	6,145.8	160,572	−11,820	210,951
July 31	78.434	5,745.5	93,887	− 8,405	202,546
August 11	79.240	5,892.4	111,831	+13,254	215,800
August 22	75.837	5,625.1	88,199	− 4,035	211,765
September 12	73.335	5,645.9	74,961	+ 862	212,627
September 23	74.583	5,792.5	89,428	+ 7,329	219,956
October 5	68.926	5,025.9	54,861	− 3,967	215,989
October 25	68.021	3,666.0	53,773	+ 2,845	218,834
November 16	70.572	5,173.2	72,095	+ 7,048	225,882

3.—Helena, Arkansas.

Ratings of meter used at Helena, Ark.

Date.	Meter.	Number of observations.	Registrations per revolution.	*a.*	*b.*	Range of velocities per second.	Where taken.	Remarks.
1882.						*Feet.*		
Feb. 2	Ellis No. 2 ..	7	1	0.0615	0.158	2.9–7.6	In a pond...	Without weight.
Feb. 16	....do	7	1	0.0614	0.354	2.7–5.9	....do	Do.
Feb. 27	....do	5	1	0.0607	0.243	2.9–7.5	....do	Do.
Apr. 12	....do	13	1	0.0609	0.474	0.8–1.9	....do	Do.
May 15	....do	10	1	0.0612	0.255	0.6–1.7	....do	Do.
May 15	... do	6	1	0.0573	0.590	3.3–5.0	....do	Meter 2 inches above weight.
May 15	....do	12	1	0.0636	0.217	0.9–2.0	....do	Meter 4 inches above weight.
May 19	....do	11	1	0.0636	0.272	0.9–1.6	....do	With weight.
May 25	....do	15	1	0.0678	0.047	2.8–6.2	....do	Do.
June 23	....do	6	1	0.0667	0.193	3.7–6.3	....do	Do.
July 20	....do	10	1	0.0680	0.128	2.8–6.2	....do	Do.
Aug. 11	....do	15	1	0.0657	0.312	1.5–5.9	....do	Do.
Sept. 8	... do	8	1	0.0647	0.395	2.4–6.7	....do	Do.
Sept. 23	....do	6	1	0.0618	0.018	2.5–5.7	....do	Do.
Oct. 9	....do	6	1	0.0614	0.187	0.7–6.5	....do	Do.

Velocities in feet per second at each tenth of depth as resulting from the velocity observations made at Helena, Ark., in 1882.

GROUP 1.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
70.2	3.87	4.34	4.54	4.36	4.27	4.42	4.20	3.54	3.22	2.73	1.96
46.5	4.48	4.42	4.34	4.43	4.46	4.38	4.45	4.13	3.80	3.10	2.50
Means=58.35	4.175	4.38	4.44	4.395	4.365	4.40	4.325	3.835	3.51	2.915	2.23

GROUP 2.

85.0	5.22	5.56	5.50	5.27	5.05	5.16	5.13	4.44	4.24	3.75	2.97
58.3	4.62	4.55	4.45	4.18	4.12	4.05	3.49	3.63	3.39	3.05	2.47
60.0	4.65	4.78	4.78	4.71	4.66	4.65	4.58	4.53	4.41	4.02	3.86
58.4	4.85	4.75	4.58	4.53	4.45	4.27	3.86	3.76	3.45	2.97	2.52
Means=65.42	4.835	4.91	4.828	4.673	4.57	4.533	4.265	4.09	3.873	3.448	2.955

Velocities in feet per second at each tenth of depth, &c.—Continued.

GROUP 3.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
65.0	6.03	6.23	6.13	6.12	5.78	6.10	5.93	5.15	5.45	5.48	4.18
85.0	5.77	5.82	5.55	5.43	5.62	5 07	5.11	5.07	4.38	3.56	2.30
72.5	5.96	6.24	6.21	5.88	5.73	5.75	5.35	5.23	4.72	4.20	3.34
70.0	5.07	5.07	5.02	5.03	4.77	4.94	4.58	4.73	3.97	3.83	3.82
72.3	5.10	5.03	5.03	4.95	4.77	4.39	4.42	4.46	4.72	4.00	4.05
50.0	6.57	6.57	6.64	6.11	5.76	5.83	6.11	5.97	5.43	5.43	4.28
63.0	4.68	4.71	4.57	4.37	4.33	4.27	4.08	3.90	3.73	3.35	2.48
60.0	5.03	4.87	4.55	4.44	4.31	4.22	4.19	3.97	3.55	3.23	2.98
56.0	4.55	4.42	4.41	4.33	4.28	4 05	3.91	3.82	3.54	3.03	2.64
Means=65.98	5.418	5.44	5.346	5.184	5.039	4.958	4.853	4.70	4.388	4.012	3.339

GROUP 4.

79.8	6.85	6.78	6.62	6.42	6.16	6.08	5.28	5.18	4.94	4.10	3.40
57.0	7.03	7.15	6.86	6.63	6.50	6 32	6.14	5.70	5.15	4.73	3.15
65.0	5.15	5.22	5.15	4.98	5.20	4.72	4 95	4.44	4.56	4.12	3.93
63.5	5.19	5.21	5.05	5.05	4.91	4.61	4.50	4.09	3.98	4.04	3.80
53.7	4.75	4.54	4.46	4.31	4.26	4.01	4.05	3.52	2.96	2.72	2.52
56.5	4.78	4.77	4.58	4.44	4.24	4.14	3.84	3.10	2.86	2.55	1.75
Means=62.58	5.625	5.612	5.453	5.305	5.212	4.98	4.793	4.338	4.075	3.71	3.092

GROUP 5.

70.0	6.44	5.82	5.52	5.46	5.16	4.85	4.64	4.44	3.73	2.98	2.40
60.0	5.89	5.77	5.69	5.37	5.27	5.15	4.87	4.72	4.42	3.70	2.62
55.0	5.95	5.96	5.73	5.63	5.45	5.19	5.16	5.10	4.63	4.05	2.83
63.5	5.95	5.53	5.40	5.33	5.13	5.32	4.82	4.62	4.50	4.00	3.63
55.0	5.29	4.87	4.60	4.19	4.22	4.34	4.19	3.85	3.41	3.02	1.66
40.0	5.05	4 92	4.80	4.64	4.41	4.35	4.07	4.01	3.85	3.42	2.52
43.6	5.04	5.04	5.00	4.82	4.63	4.45	4.32	3.90	3.54	3.08	2.62
45.0	4.72	4.55	4.47	4.45	4.37	4.28	4.08	4.02	3.68	3.40	2.62
Means=54.01	5.541	5.308	5.151	4.986	4.83	4.741	4.519	4.333	3.97	3.456	2.613

GROUP 6.

70.0	6.03	5.95	5.87	5.67	5.82	5.59	5.00	4.86	3.93	3.30	2.88
57.1	5.34	5.32	5.14	4.86	4.73	4.72	4.57	4.36	3.92	3.55	2 90
45.0	5.94	6.17	6.42	6.15	5.97	5.45	5.37	5.27	5.14	5.00	3.66
51.0	5.82	5.86	5.82	5.57	5.52	5.57	5.25	5.18	4.71	4.39	4.45
38.3	4.95	4.90	4.65	4.33	4.14	4.05	3.85	3.66	3.47	3.34	2.64
36.0	5.19	5.00	4.65	4.29	4.34	4.16	3.97	3.90	3.46	3.13	2.85
40.5	5.24	5.10	4.96	4.91	4.78	4.37	4.17	4.22	3.70	3.04	3.13
41.0	4.98	4.92	4.83	4.68	4.47	4.30	4.32	3.95	3.20	2.60	2.42
Means=47.36	5.436	5.403	5.293	5.058	4.949	4.776	4.563	4.425	3.941	3.544	3.116

GROUP 7.

60.0	7.12	6.94	6.68	6.48	6.30	6.18	5.81	5.35	4.90	4.74	4.59
60.0	6.13	5.87	5.59	5.74	5.63	5.55	5.24	4.96	4.66	4.23	3.20
50.0	6.04	6.10	5.98	5.67	5.77	5.63	5.28	5.45	4 38	4.42	3.50
51.2	6.04	6.00	5.76	5.73	5.35	5.42	5.12	4.84	4.65	3.76	3.10
51.8	5.64	5.90	5.62	5.26	4.96	5.03	4.87	4.77	4.50	4.16	4.14
42.5	4.88	4.80	4.72	4.65	4.56	4.44	4.12	3.75	3.78	3.55	3.39
36.2	4.75	4.82	4.77	4.54	4.46	4.39	3.98	3.64	3.50	3.20	2.85
32.5	4.95	4.95	4.93	4.90	4.87	4.60	4.38	4.15	3.86	3.35	2.57
36.0	5.24	5.15	5.00	4.82	4.62	4.47	4.47	4.44	3.91	3.45	3.04
35.0	5.12	4.96	4.83	4.96	4.77	4.91	4.76	4.45	4.23	3.90	3.47
Means=45.52	5.591	5.549	5.388	5.275	5.129	5.062	4.803	4.58	4.237	3.876	3.385

Velocities in feet per second at each tenth of depth, &c.—Continued.

GROUP 8.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
59.0	6.43	6.27	6.37	6.67	6.48	6.36	5.82	5.62	5.17	4.15	3.30
55.0	7.23	6.94	7.10	7.05	6.75	6.40	5.99	5.75	5.43	4.55	3.40
53.0	7.66	7.50	7.10	6.83	6.65	6.58	6.37	5.94	5.00	4.70	4.09
50.0	6.02	6.28	5.93	5.64	5.71	5.54	5.13	4.97	4.83	4.38	3.16
48.1	5.41	5.41	5.30	5.39	5.31	5.22	5.06	4.25	3.82	3.26	2.50
47.0	6.47	6.25	6.02	5.83	5.79	5.77	5.32	4.85	4.34	3.76	3.06
47.5	6.52	6.38	5.78	5.86	6.02	6.08	5.55	5.43	5.15	4.40	3.06
41.5	5.39	5.36	5.16	4.98	4.90	4.95	4.75	4.64	4.20	3.64	3.18
30.0	5.24	5.28	5.22	4.98	4.83	4.70	4.46	4.25	4.15	3.49	2.74
32.7	5.24	5.25	5.15	5.13	4.93	4.83	4.62	4.56	4.36	3.76	3.13
Means=46.38	6.161	6.092	5.913	5.836	5.737	5.643	5.307	5.026	4.645	4.009	3.216

GROUP 9.

54.0	6.03	6.87	6.57	6.51	6.62	6.35	6.02	5.82	5.51	4.70	3.37
48.0	6.44	6.27	6.12	5.87	5.96	5.67	5.18	4.78	4.60	4.25	3.87
50.0	6.23	6.07	6.07	6.07	5.67	5.66	5.37	5.18	4.70	4.38	2.46
50.0	6.32	6.07	5.98	5.80	5.49	5.22	5.04	4.85	4.76	4.23	2.77
29.6	4.35	4.32	4.27	4.23	4.13	3.96	3.86	3.77	3.66	3.40	2.98
30.7	4.25	4.55	4.66	4.50	4.38	4.27	4.13	3.96	3.76	3.65	3.53
33.0	4.65	4.46	4.45	4.58	4.40	4.25	3.32	4.22	3.87	3.56	3.20
Means=42.19	5.467	5.516	5.446	5.366	5.236	5.054	4.846	4.654	4.409	4.024	3.169

GROUP 10.

51.5	6.43	6.68	6.56	6.50	6.47	6.32	5.79	4.94	4.04	4.00	3.08
47.0	6.14	6.28	6.23	6.25	6.27	5.94	5.62	5.52	5.57	5.00	2.92
39.0	4.35	4.41	4.34	4.26	4.22	4.22	3.92	3.75	3.58	3.05	2.55
29.5	3.39	3.47	3.49	3.36	3.33	3.34	3.18	3.04	3.01	2.67	2.04
26.0	3.99	3.80	3.98	3.80	3.78	3.68	3.77	3.67	3.63	3.45	3.13
26.0	4.45	4.39	4.32	4.25	4.18	4.13	4.17	4.14	4.06	3.83	3.60
Means=36.50	4.792	4.838	4.82	4.737	4.708	4.605	4.408	4.177	3.982	3.667	3.033

GROUP 11.

38.0	4.83	4.82	4.84	4.81	4.71	4.62	4.29	3.96	3.49	3.00	2.53
49.5	4.68	5.03	4.68	4.29	4.60	4.17	3.89	4.05	3.35	2.60	1.83
28.0	3.28	3.35	3.28	3.12	3.08	3.07	2.96	2.87	2.78	2.71	2.68
26.0	3.73	3.73	3.72	3.63	3.52	3.45	3.42	3.41	3.36	3.20	3.03
24.9	3.25	3.17	2.85	2.85	2.86	2.87	2.72	2.72	2.72	2.50	2.31
27.2	3.27	3.31	3.31	3.16	2.96	2.66	2.64	2.63	2.62	2.62	2.63
25.0	3.01	3.06	3.13	3.00	2.87	3.07	3.20	2.94	2.67	2.47	2.23
Means=31.23	3.721	3.784	3.687	3.551	3.514	3.416	3.303	3.226	2.999	2.729	2.459

GROUP 12.

27.0	4.83	4.83	4.81	4.69	4.57	4.44	4.22	3.92	3.72	3.57	3.43
51.0	6.17	6.32	6.24	6.14	5.82	5.72	5.25	5.28	4.83	4.80	4.55
32.6	4.38	4.68	4.65	4.25	4.15	4.07	3.60	3.63	3.51	2.81	2.17
Means=36.87	5.127	5.277	5.233	5.027	4.847	4.743	4.357	4.277	4.020	3.727	3.383

Velocities in feet per second for each tenth of depth, &c.—Continued.

GROUP 13.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
25.5	5.08	5.12	5.15	4.83	4.57	4.80	4.43	4.54	4.54	3.77	3.13
22.5	5.23	5.23	5.23	5.19	5.14	5.08	4.60	4.10	3.58	3.13	2.64
21.2	3.71	3.63	3.56	3.59	3.67	3.63	3.16	2.72	2.33	2.00	1.64
10.5	3.36	3.33	3.30	3.32	3.34	3.37	3.36	3.34	3.28	3.07	2.85
7.0	2.54	2.51	2.47	2.44	2.37	2.31	2.25	2.17	2.14	2.11	2.07
16.6	2.94	2.95	2.96	2.97	2.94	2.92	2.80	2.65	2.49	2.32	2.15
Means=17.22	3.810	3.795	3.778	3.723	3.672	3.685	3.433	3.253	3.060	2.733	2.413

GROUP 14.

27.0	5.08	5.17	5.24	5.12	5.00	4.86	4.78	4.72	4.31	3.70	3.05
19.0	4.11	4.02	3.93	3.83	3.68	3.53	3.42	3.28	3.09	2.84	2.68
18.8	3.66	3.54	3.40	3.33	3.37	3.39	3.28	2.96	2.57	2.25	1.96
26.5	4.45	4.43	4.43	4.46	4.44	4.11	3.87	3.87	3.73	3.48	3.25
Means=22.82	4.325	4.290	4.250	4.185	4.123	3.973	3.838	3.708	3.425	3.068	2.735

4.—Hays' Landing, Mississippi.

Ratings of meters used at Hays Landing, Miss.

Date.	Meter.	Number of observations.	Registrations per revolution.	*a*	*b*	Range of velocities.	Where taken.
1882.						*Feet per second.*	
March 18	2	19	1	0.0576	0.6083	1.41–7.69	In a pond.
April 2	2	18	1	0.0573	0.5528	1.23–5.80	Do.
May 27	2	20	1	0.0578	0.6809	1.38–7.84	Do.
October 9	4	30	1	0.0517	0.5167	1.01–7.45	Do.

Velocities in feet per second at each tenth of depth as resulting from the velocity observations made at Hays Landing, Miss., in 1882.

STATION 2.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9
22.0	3.46	3.55	3.64	3.60	3.51	3.42	3.35	3.26	3.13	3.00
23.0	3.57	3.57	3.57	3.53	3.48	3.43	3.37	3.32	3.27	3.23
23.0	3.34	3.45	3.55	3.40	3.38	3.31	3.26	3.15	2.99	2.88
22.0	3.23	3.23	3.23	3.29	3.28	3.17	3.14	3.11	2.88	2.76
21.0	3.34	3.31	3.34	3.31	3.27	3.23	3.23	3.23	3.01	2.76
21.4	2.92	3.86	3.82	3.72	3.56	3.43	3.33	3.24	3.23	3.23
32.0	3.23	3.15	3.05	2.91	2.94	2.99	2.99	3.21	3.38	2.92
Means = 23.49	3.441	3.450	3.457	3.407	3.346	3.283	3.239	3.217	3.127	2.967

STATION 4.

68.0	4.15	4.63	4.85	4.87	5.10	5.35	4.74	4.36	4.32	4.00
70.0	4.73	4.75	4.79	4.75	4.68	4.67	4 42	4.53	4.45	4.35
66.0	4.85	4.93	5.08	5.18	5.27	5.12	4.97	4.85	4.85	4.74
68.0	4.61	4.61	4.57	4.50	5.47	4.40	4.37	4.33	4.16	4.15
60.0	4.73	4.75	4.76	4.76	4.45	4.61	4.59	4.46	4.46	4.59
62.0	5.08	5.08	4.97	4.67	4.84	4.80	4.52	4.32	3.95	3.66
60.9	6.70	7.16	7.16	7.16	6.76	6.67	6.40	6.23	6.23	6.02
58.5	4.04	4.03	4.32	4.04	3.91	3.72	3.92	3.84	3.69	3.33
55.5	3 69	3.85	4.15	4.07	3.92	3.92	3.92	3.92	3.72	3.69
55.0	3.69	3.69	3.69	3.72	3.85	3.81	3.56	3.38	3.16	2.98
51.0	3.23	3.00	3.23	3.26	3.54	3.25	3.30	2.98	2.88	2.85
49.8	3.11	3.00	2.99	3.22	3.23	3.16	3.12	3.22	2.77	2.43
40.0	1.34	1.34	1.28	1.20	1.14	1.14	1.06	1.03	1.00	0.92
50.1	3.69	3.69	3.69	3.69	3.69	3.57	3.57	3.46	3.34	3.23
42.5	2.42	2.52	2.67	2.64	2.44	2.30	2.30	2.30	2.30	2.07
44.2	2.53	2.53	2.53	2.53	2.48	2.37	2.27	2.18	2.17	2.09
43.0	2.76	2.76	2.60	2.53	2.49	2.39	2.29	2.18	2.08	2.07
44.0	2.76	2.76	2.76	2.76	2.71	2.65	2.65	2.59	2.53	2.53
44.2	2.65	2.65	2.56	2.53	2.53	2.44	2.30	2.30	2.29	2.19
43.0	2.88	2.78	2.76	2.70	2.60	2.53	2.53	2.53	2.44	2.24
41.9	2.76	2.76	2.76	2.76	2.72	2.58	2.30	2.27	2.22	2.18
43.8	2.59	2.49	2.56	2 59	2.54	2.48	2.26	2.17	2.17	2.09
44.8	2.17	2.37	2.22	2.10	2.01	1.86	1.72	1.60	1.43	1.34
42.9	2.17	2.17	2.10	2.07	1.98	1.92	2.05	1.96	1.79	1.65
41.1	1.96	1.96	2.10	2.17	2.14	2.06	1.97	1.81	1.76	1.76
41.1	2.28	2.19	2.17	2.12	2.04	1.95	1.87	1.79	1.70	1.65
39.5	2.17	2.09	2.13	2.13	1.99	1.58	1.55	1.55	1.52	1.45
39.1	1.76	1.92	1.96	1.96	1.95	1.87	1.79	1.76	1.73	1.65
38.0	2.38	2.30	2.22	2.17	2.17	2.09	2.01	1.90	1.75	1.57
38.1	2.38	2.38	2.27	2.17	2.16	2.00	1.96	1.93	1.86	1.88
39.1	1.96	2.05	2.01	1.96	1.95	1.87	1.86	1.82	1.75	1.65
37.0	2.59	2.59	2.64	2.67	2.69	2,48	2.44	2.38	2.38	2.38
38.1	2.17	2.17	2.17	2.14	2.06	1.82	1.64	1.55	1.54	1.46
39.5	1.96	1.96	1.96	1.96	1.96	1.96	1.89	1.86	1.83	1.76
39.4	2.07	2.97	2.07	2.03	1.95	1.87	1.79	1.70	1.62	1.55
37.1	1.96	1.96	1.96	2.01	2.16	2.02	1.96	1.94	1.87	1.86
39.5	1.65	1.74	1.76	1.76	1.76	1.76	1.76	1.76	1.73	1.65
38.1	1.96	1.96	1.86	1.70	1.55	1.55	1.55	1.52	1.44	1.36
38.5	2.17	2.01	1.85	1.79	1.85	1.78	1.63	1.55	1.53	1.46
38.7	2.17	2.17	2.17	2.10	1.94	1.77	1.82	1.66	1.34	1.34
37.9	2.07	2.15	2.06	2.02	2.06	1.91	1.81	1.73	1.64	1.57
37.1	1.76	1.76	1.76	1.76	1.76	1.68	1.65	1.65	1.65	1.58
38.0	1.96	1.96	1.91	1.86	1.86	1.78	1.76	1.73	1.64	1.57
38.9	2.07	2.07	2.07	2.03	1.94	1.78	1.69	1.61	1.55	1.55
37.5	2.17	2.10	2.07	2.04	1.96	1.89	1.81	1.73	1.65	1.58
38.1	2.07	1.99	1.96	1.99	2.06	1.82	1.76	1.72	1.64	1.56
37.5	2.07	2.07	2.07	2.02	1.86	1.86	1.86	1.83	1.76	1.76
38.0	2.38	2.30	2.17	2.04	1.96	1.96	1.90	1.83	1.75	1.67
39.5	2.28	2.36	2.31	2.24	2.11	1.78	1.83	1.81	1.70	1.45
38.7	2.38	2.38	2.38	2.38	2.37	2.29	2.28	2.24	2.09	1.77
39.1	2.28	2.20	2.17	2.13	1.97	1.87	1.86	1.86	1.86	1.86
39.4	2.17	2.26	2.28	2.20	2.05	1.85	1.89	1.86	1.86	1.86
42.3	2.28	2.28	2.20	2.17	2.17	2.17	2.16	2.06	1.99	1.80
42.0	2.48	2.48	2.41	2.38	2.42	2.46	2.38	2.29	2.28	2.20
41.8	2.28	2.36	2.31	2.33	2.35	2.26	2.17	1.99	1.89	1.80
41.5	2.48	2.48	2.41	2.38	2,41	2.46	2.38	2.30	2.28	2.23
Means = 44.61	2.716	2.733	2.729	2.698	2.668	2.571	2.495	2.423	2.339	2.243

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 6.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9
62.8	4.44	5.37	5.28	5.93	6.17	5.78	5.13	4.84	4.54	4.16
68.0	5.37	5.18	5.08	5.42	5.74	5.68	5.54	5.15	4.92	4.00
66.0	4.73	4.87	4.65	4.78	5.45	5.40	5.20	5.06	4.89	4.75
67.5	5.79	5.18	5.18	5.60	6.17	5.89	5.51	4.95	4.52	4.06
65.0	5.08	5.02	4.92	5.07	5.08	5.18	5.22	5.50	4.98	4.62
65.2	5.08	5.15	4.94	4.75	4.70	4.96	5.04	4.84	4.73	4.32
63.5	4.61	5.24	4.83	4.81	4.75	4.88	4.73	4.43	4.15	4.24
63.0	3.92	4.04	4.19	4.28	4.16	4.65	4.40	4.04	3.67	3.38
60.0	4.15	4.15	4.15	4.02	3.92	4.04	3.97	4.05	3.84	3.72
59.5	3.92	4.07	4.06	3.92	3.92	3.92	3.91	3.76	3.58	3.31
60.0	3.46	3.57	3.62	3.69	3.97	3.80	3.64	3.37	3.09	2.82
55.8	3.69	3.69	3.58	3.33	3.85	3.91	3.73	3.51	3.26	2.89
52.5	3.46	3.46	3.62	3.88	3.72	3.74	3.46	3.14	2.94	3.83
53.4	3.69	3.69	3.69	3.69	3.66	3.57	3.52	3.46	2.46	3.33
45.0	2 99	2.99	3.08	2.94	3.82	2.76	2.72	2.65	2.64	2.52
46.0	2.76	2.87	2.69	2.65	2.57	2.53	2.53	2.53	2.49	2.36
47.0	3.46	3.46	3.36	3.25	3.23	2.23	3.15	3.04	2.94	2.82
46.8	2.99	3.10	3.21	3.04	2.99	2.92	2.81	2.76	2 71	2.60
46.0	2.99	2.99	2.91	2.88	2.88	2.81	2.77	2.62	2.53	2.53
45.2	2.99	3.10	3.11	3.03	2.78	2.65	2.65	2.62	2.47	2.14
47.9	2.69	2.69	2.60	2.59	2.50	2.48	2.41	2.31	2.28	2.21
46.8	3.00	3.00	2.92	2.65	2.44	2.32	2.22	2.12	2.03	1.90
43.5	2.69	2.60	2.66	2.63	2.54	2.37	2.17	2.17	2.17	1.96
45.5	2.48	2.58	2.59	2.51	2.42	2.33	2.33	2.34	2.25	2.17
45.0	2.59	2.40	2.38	2.38	2.38	2.38	2.30	2.11	1.88	1.55
43.0	2.59	2.59	2.51	2.42	2.34	2.22	2.05	1.96	1.78	1.68
42.1	2.79	2.76	2.72	2.69	2.58	2.38	2.38	2.38	2.23	2.11
43.0	2.79	2.63	2.52	2.43	2.29	2.14	2.08	2.17	2.17	2.10
42.5	3.00	2.82	2.79	2.68	2.51	2.36	2.28	2.28	2.19	2.17
42.8	2.79	2.79	2.79	2.73	2.69	2.66	2.58	2.48	2.40	2.31
42.0	1.55	1.55	1.55	1.61	1.62	1.51	1.34	1.34	1.28	1.19
42.1	2.69	2.69	2.69	2.64	2.59	2.59	2.59	2.59	2.52	2.42
41.4	2.59	2.59	2.66	2.54	2.41	2.47	2.38	2.30	2.21	2.07
42.0	2.59	2.59	2.59	2.59	2.55	2.48	2.48	2.39	2.31	2.22
41.8	2.59	2.59	2.52	2.43	2.35	2.28	2.28	2.28	2.21	2.10
42.0	2.48	2.48	2.48	2.48	2.44	2.34	2.17	2.08	1.99	1.96
40.1	2.59	2.59	2.59	2.59	2.57	2.48	2.48	2.48	2.44	2.25
40.9	2.63	2.63	2.59	2.54	2.45	2.37	2.29	2.35	2.27	2.10
40.8	2.38	2.38	2.32	2.33	2.33	2.16	1.98	1.96	1.91	1.86
40.4	2.38	2.38	2.24	2.17	2.17	2.17	2.17	1.90	1.57	1.25
42.4	2.28	2.28	2.35	2.38	2.29	2.14	2.06	1.97	1.81	1.70
39.8	2.59	2.59	2.53	2.45	2,33	2.07	1.91	1.75	1.62	1.53
39.9	2.57	2.57	2.59	2.55	2.46	2.38	2.30	2.22	2.09	1.87
40.1	2.48	2.48	2.55	2.51	2.34	2.17	2.09	2.00	1.92	1.83
40.0	2.71	2.71	2.63	2.59	2.57	2.48	2.40	2.38	2.34	2.28
40.2	2.40	2.40	2.44	2 44	2.36	2.28	2.11	2.00	1.92	1.86
40.9	2.48	2.48	2.48	2.48	2.45	2.38	2.38	2.38	2.38	2.32
40.2	2.71	2.71	2.69	2.60	2.48	2.48	2.40	2.32	2.23	2.13
41.5	2.50	2.50	2.48	2.43	2.41	2.47	2.38	2.38	2.25	2.07
43.1	2.79	2.79	2.79	2.79	2.75	2.69	2.67	2.59	2.59	2.43
40.7	2.81	2.81	2.73	2.69	2.67	2.59	2.49	2.48	2.38	2.22
41.5	2.81	2.81	2.72	2.64	2.59	2.57	2.50	2.48	2.42	2.20
44.0	2.79	2.79	2.79	2.79	2.74	1.65	2.59	2.52	2.16	2.07
43.8	3.00	3.00	2.93	2 96	2.90	2.75	2.69	2.65	2.38	2.29
43.0	2.99	2.99	3.00	3.00	2.91	2.70	2.50	2.59	2.41	2.23
43.7	3.18	3.18	3.21	3.21	3.11	2.92	2.77	2.68	2.59	2.50
Means = 47.48	3.136	3.136	3.103	173.10	3.090	2.991	2.908	2.816	2.677	2.527

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 8.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9
64.0	5.31	3.51	5.52	5.84	6.02	6.09	6.02	5.90	5.89	5.83
69.8	5.66	5.42	5.50	5.75	5.60	5.76	5.75	5.87	5.89	5.87
68.0	5.77	5.45	5.14	5.35	5.76	5.71	5.31	5.19	5.08	4.80
63.0	4.96	5.04	5.42	5.72	5.32	5.41	5.08	4.69	4.58	4.31
61.9	4.85	5.02	5.06	5.96	6.02	5.96	5.49	5.15	4.85	5.20
60.5	4.38	4.38	4.43	4.57	4.82	4.51	4.22	4.16	3.76	3.48
58.8	4.15	4.24	4.70	5.07	4.80	4.61	4.38	4.33	4.15	4.02
57.0	4.38	4.36	4.15	4.20	4.27	4.35	4.38	4.15	3.68	3.53
49.5	4.38	4.61	4.61	4.38	4.16	4.15	4.36	4.18	4.16	4.05
45.5	3.46	3.46	3.46	3.64	3.62	3.51	3.46	3.42	3.32	3.22
44.2	3.69	3.69	3.69	3.69	3.63	3.57	3.53	3.46	3.46	3.46
43.0	3.69	3.59	3.57	3.57	3.66	3.72	3.62	3.79	3.59	3.57
45.1	3.23	3.65	3.87	3.75	3.62	3.63	3.60	3.53	3.63	3.30
40.9	3.80	3.72	3.76	3.86	3.92	3.91	3.82	3.72	3.62	3.27
42.0	3.11	3.40	3.32	3.36	3.38	3.22	3.11	3.11	2.96	2.83
42.8	3.92	3.82	3.80	3.73	3.64	3.47	3.23	3.23	2.83	2.68
44.0	3.41	3.41	3.33	3.30	3.16	3.13	2.97	3.88	2.79	2.79
44.1	3.62	3.44	3.57	3.35	3.21	3.08	2.87	2.73	2.48	2.30
43.2	3.31	3.34	3.24	3.21	3.21	3.14	3.00	2.99	2.81	2.69
41.0	3.41	3.25	3.21	3.21	3.21	3.19	3.02	2.93	2.73	2.59
39.9	3.00	3.00	3.00	3.00	3.00	3.00	2.92	2.90	2.86	2.79
38.0	2.79	2.64	2.75	2.93	2.98	2.75	2.69	2.61	2.36	2.19
39.9	2.59	2.59	2.65	2.69	2.67	2.59	2.59	2.59	2.51	2.38
39.5	2.69	2.69	2.63	2.63	2.66	2.40	2.31	2.22	2.14	2.05
40.5	3.31	2.98	2.83	2.79	2.72	2.48	2.48	2.41	2.33	2.23
38.5	3.10	3.02	2.89	2.79	2.78	2.71	2.63	2.59	2.57	2.49
39.2	1.96	1.81	1.87	1.88	1.75	1.66	1.58	1.55	1.52	1.44
39.5	2.79	2.79	2.79	2.79	2.77	2.70	2.69	2.64	2.56	2.48
40.5	3.00	3.17	3.21	3.21	3.14	2.89	2.81	2.79	2.74	2.69
39.9	2.59	2.91	2.75	2.59	2.62	2.69	2.77	2.67	2.54	2.46
39.9	2.79	2.96	3.00	2.92	2.75	2.59	2.59	2.41	2.24	2.17
41.0	2.79	2.79	2.79	2.79	2.76	2.68	2.60	2.59	2.53	2.40
38.5	2.79	2.79	2.79	2.78	2.58	2.50	2.55	2.63	2.46	2.39
38.5	3.00	3.00	2.95	2.87	2.79	2.79	2.79	2.75	2.67	2.60
37.1	2.79	2.87	2.84	2.70	2.40	2.53	2.54	2.48	2.48	1.86
37.9	2.90	2.90	2.85	2.82	2.89	2.66	2.48	2.33	2.36	2.13
37.5	2.59	2.74	2.89	2.88	2.59	2.59	2.59	2.54	2.38	2.31
41.0	3.10	3.02	3.00	2.95	2.82	2.57	2.41	2.38	2.26	2.11
40.6	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.03	3.00	2.90
40.3	3.21	3.21	3.14	3.06	2.98	2.90	2.81	2.66	2.50	2.29
40.0	3.00	3.00	2.87	2.79	2.77	2.69	2.61	2.52	2.44	2.38
40.9	2.90	2.81	2.86	2.85	2.79	2.78	2.70	2.62	2.53	2.48
40.0	3.00	3.00	3.00	2.96	2.90	2.90	2.73	2.63	2.55	2.43
40.0	3.21	3.21	3.21	3.13	2.98	2.90	2.86	2.73	2.65	2.59
40.5	3.00	3.00	3.06	3.10	3.08	3.00	3.00	2.86	2.74	2.62
41.1	3.21	3.21	3.21	3.16	3.07	2.99	2.91	2.82	2.68	2.53
41.2	3.21	3.21	3.14	3.05	3.00	3.00	3.00	2.92	2.78	2.63
40.9	3.31	3.31	3.25	3.21	3.18	3.09	3.01	2.85	2.63	2.42
41.7	3.62	3.44	3.41	3.32	3.17	3.08	3.00	2.92	2.82	2.74
45.0	3.62	3.43	3.41	3.34	3.37	3.36	3.23	3.04	2.90	2.90
41.5	3.62	3.54	3.45	3.41	3.38	3.31	3.31	3.14	3.10	2.91
43.1	3.72	3.72	3.65	3.62	3.57	3.45	3.27	3.08	3.01	2.93
Means = 44.46	3.438	3.435	3.434	3.454	3.405	3.336	3.246	3.160	3.041	2.917

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 10.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9
82.0	5.07	6.30	6.70	6.70	6.47	6.08	5.63	4.97	4.56	4.00
74.5	4.61	4.85	4.85	4.95	4.75	5.50	4.61	4.64	4.41	4.05
77.2	4.61	4.61	4.97	5.08	5.13	5.15	4.58	5.14	4 61	4.41
76 0	4.38	4.75	5.33	6.00	5.50	5.35	5.46	4.69	4.38	3.98
68.0	4.38	4.32	4.30	4.58	4.44	4.58	4.25	4.11	3.83	3.69
70.5	4.85	4.85	4.85	4.85	4.85	4.72	4.56	4.40	4.24	4.08
69.5	4.61	4.95	4.70	5.16	5.21	5.09	5.15	5.00	4.84	4.67
68.9	4.85	4.70	4.67	4.83	4.67	4.61	4 50	4.50	4.38	4.22
64.0	4.38	4.38	4.38	4.29	4.28	4.38	4.31	4.27	4.24	4.15
63.0	4.27	4.27	4.27	4.27	4.27	4.23	4.15	4.15	4.14	4.00
63.0	4.15	4.42	4 21	4.35	4.16	4.23	4.15	4.07	3.92	3.87
61.5	3.46	4.13	4.14	4.49	4.61	4.47	4.34	4.27	3.97	3.65
59.2	3.92	3.16	4.15	4.15	4 15	4.15	4.15	4.12	3.98	3.83
61.7	3.92	3.89	3.80	3.88	3.92	4.11	3.92	3.77	3.52	3.20
64.0	3.83	3.72	3.78	3.83	3.72	3.68	3.55	3.41	3.39	3.31
65 5	3.62	3.62	3.62	3.62	3.84	3.84	3 63	3.50	3.31	3.21
62.2	3.62	3.54	3.57	3.59	3.62	3.62	3.57	3.52	3.23	3 08
62.5	3 93	3.67	3 72	3.78	4.03	3.82	3.66	3.53	3.52	3.41
61.5	3.62	3.46	3.62	3.62	3.62	3.41	3.37	3.31	3.23	3.21
53.3	3.21	5.21	3.21	3.23	3.33	3.41	3.33	2.93	2.53	2.43
50.9	3.00	3.21	3 21	3.21	3.20	3.10	3.10	3.09	3.00	3.00
58.0	3.21	3.21	3.21	3.21	3.21	3.21	3.11	3.09	3.00	2.91
55.0	3.21	3.21	3.21	3.00	3 00	2.90	2.79	2.65	2.59	2.49
56.0	3.21	3.21	3.21	3.17	3.10	3.10	3.03	3 00	2.80	2.79
62.4	2.90	2.90	2.85	2.79	2.79	2.77	2.69	2.62	2.59	2.54
61.8	3.21	3.21	3.21	3.21	3.11	3.10	3.10	3.10	3.01	2.76
54.0	3.21	3.21	3.21	3.18	3.10	3.10	2.95	2.79	2.66	2.51
59.0	3.21	3.21	3.21	3 21	3.13	3.10	3.09	3.00	2.96	2.83
56.0	3.21	3.21	3.21	3.17	3.10	3.10	3.03	3.00	2.90	2.78
58.5	3.21	3 21	3.21	3.21	3.21	3.12	3.10	3.08	3.00	2.95
59.8	3.21	3 29	3 21	3.21	3.12	3.00	2.98	2.88	2.79	2.64
56.0	3.21	3.21	3.21	3.17	3.10	3.04	2.85	2.79	2.69	2.46
59.8	3.10	3.10	3.06	3.00	3.00	3.00	2.90	2.86	2.79	2.64
58 5	3.00	3.00	3 00	2.95	2.90	2.90	2.79	2 79	2.75	2.64
58.8	2.90	2.92	2 93	2.79	2.79	2.79	2.59	2.61	2.65	2.53
59.8	3.21	3.21	3.21	3.21	3.21	3.10	3.02	3.00	2.88	2.79
55.0	3.21	3.21	3.21	3.21	3.21	3.16	3.10	3.10	3.02	3.00
50.0	2.21	3 21	3.21	3.21	3.10	3 10	2.79	2.79	2.59	2.48
59 0	3.21	3.21	3.21	3.21	3.13	3.10	3.00	2.95	2.79	2.73
52.5	3.00	3.01	3.10	3.09	3.00	2.98	2 90	2.86	2.79	2.75
59.2	3.10	3.10	3.10	3 10	3.10	3.01	3.00	2.97	2.90	2.83
57.0	3.31	3.31	3.31	3.31	3.25	3.21	3 03	3.00	2.89	2.74
59.0	3.41	3.41	3.37	3.31	3.24	3.21	3.10	3.07	2.91	2.73
59 2	3.41	3.41	3.41	3.41	3.34	3.31	3.21	3.18	3 05	2.80
55.0	3.41	3.41	3.41	3.41	3.37	3.31	3.25	3.21	3.04	2.79
57.9	3.52	3.44	3 55	3.36	3.31	3.23	3.21	3.10	3.07	2.87
59.9	3.62	3.62	3.58	3.46	3.33	3.31	3.21	3.17	3.10	3.02
59.1	3.62	3.64	3.65	3.52	3.44	3.41	3 31	3.28	3.16	3.04
59.0	3.72	3.72	3.72	3.67	3.62	3.62	3.52	3.49	3.32	3.14
59.2	3.83	3 83	3.79	3.72	3.65	3.62	3.62	3.62	3.57	3.34
Means = 61.07	3.622	3.657	3.696	3.719	3.675	3.649	3.525	3.448	3.310	3.079

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 12.

Depth.	Surface.	.1	.2	.3	.4	.5	6.	.7	.8	.9
86. 2	5. 54	6. 07	5. 66	6. 04	5. 83	5. 23	5. 54	5. 28	4. 90	4. 73
85. 0	4. 85	5. 03	5. 02	5. 36	6. 00	5. 48	5. 25	5. 28	4. 78	4. 61
76. 0	5. 54	5. 18	5. 07	4. 90	4. 85	4. 85	4. 73	4. 27	4. 38	4. 23
68. 9	4. 27	4. 20	4. 18	4. 15	4. 21	4. 27	4. 35	4. 10	4. 15	4. 06
68. 4	4. 50	4. 52	4. 38	4. 25	4. 15	4. 15	4. 15	4. 21	3. 93	3. 80
68. 2	4. 38	4. 38	4. 30	4. 38	4. 38	4. 38	4. 27	3. 96	4. 15	4. 01
69. 0	4. 15	4. 23	4. 15	4. 25	4. 27	4. 17	4. 12	4. 02	3. 80	3. 69
68. 4	4. 15	4. 15	4. 15	4. 38	4. 44	4. 40	4. 15	3. 98	3. 70	3. 42
68. 2	4. 15	4. 19	4. 27	4. 27	4. 22	4. 15	4. 13	3. 74	3. 92	3. 77
68. 4	4. 04	4. 00	3. 92	3. 92	3. 92	3. 92	3. 87	3. 52	3. 69	3. 65
71. 3	4. 03	3. 83	3. 83	3. 83	3. 76	3. 62	3. 62	3. 62	3. 41	3. 33
69. 0	3. 83	3. 83	3. 83	3. 83	3. 83	3. 73	3. 62	3. 52	3. 52	3. 33
64. 5	3. 72	3. 72	3. 72	3. 72	3. 72	3. 72	3. 69	3. 55	3. 35	3. 21
69. 0	3. 83	3. 83	3. 75	3. 72	3. 72	3. 63	3. 72	3. 52	3. 52	3. 41
69. 0	3. 83	3. 83	3. 75	3. 72	3. 67	3. 62	3. 62	3. 52	3. 41	3. 37
67. 4	3. 41	3. 41	3. 34	3. 31	3. 35	3. 34	3. 60	3. 16	3. 10	3. 00
65. 9	3. 41	3. 68	3. 69	3. 57	3. 47	3. 50	3. 22	2. 97	2. 90	2. 81
65. 8	3. 41	3. 41	3. 35	3. 41	3. 41	3. 29	3. 21	2. 98	2. 84	2. 71
65. 8	3. 21	3. 35	3. 34	3. 41	3. 36	3. 03	2. 80	2. 69	2. 64	2. 59
64. 5	3. 52	3. 28	3. 27	3. 31	3. 29	3. 21	3. 21	3. 10	3. 07	3. 00
65. 1	3. 41	3. 31	3. 31	3. 31	3. 21	3. 15	3. 02	2. 99	2. 90	2. 82
60. 4	3. 62	3. 62	3. 62	3. 62	3. 45	3. 48	3. 41	3. 41	3. 41	3. 32
64. 5	3. 41	3. 58	3. 21	3. 21	3. 21	3. 21	3. 05	2. 99	2. 90	2. 83
66. 9	3. 41	3. 45	3. 41	3. 41	3. 41	3. 34	3. 31	3. 27	3. 21	3. 10
66. 5	3. 41	3. 41	3. 41	3. 41	3. 31	3. 31	3. 31	3. 21	3. 21	3. 10
66. 0	3. 41	3. 34	3. 41	3. 41	3. 38	3. 25	3. 21	2. 95	2. 68	2. 49
61. 4	3. 41	3. 45	3. 07	3. 07	3. 00	2. 97	2. 75	2. 69	2. 61	2. 59
64. 1	3. 41	3. 21	3. 13	3. 13	2. 97	2. 88	2. 93	2. 79	2. 67	2. 53
62. 1	3. 31	3. 41	3. 21	3. 21	3. 31	3. 19	2. 96	2. 94	2 80	2. 67
65. 4	3. 31	3. 21	3. 22	3. 22	3. 21	3. 21	3. 21	2. 81	2. 95	2. 84
60 8	3. 21	3. 33	3. 25	3. 25	3. 21	3. 09	3. 27	3. 29	2. 79	2. 70
59. 5	3. 72	3. 50	3. 46	3. 46	3. 49	3. 34	3 21	3. 17	3. 05	3. 00
61. 0	3. 52	3. 52	3. 45	3. 45	3. 41	3. 41	3. 38	3. 26	3. 05	2. 92
63. 5	3. 31	3. 34	3. 25	3. 25	3. 09	2. 97	2. 83	2. 79	2. 69	2. 56
65. 0	3. 31	3. 31	3. 21	3. 21	3. 10	3. 06	3. 12	2. 00	3. 00	2. 85
66. 1	3. 41	3. 31	3. 21	3. 21	3. 21	3. 14	3. 10	2. 87	2. 73	2. 69
65. 2	3. 31	3. 31	3. 31	3. 31	3. 21	3. 15	3. 10	3. 00	2 91	2. 56
61. 3	3. 41	3. 50	3. 38	3. 38	3. 41	3. 30	3. 25	3. 37	3. 32	2. 78
66. 0	3. 62	3. 62	3. 41	3. 41	3. 28	3. 40	3. 42	3. 14	2. 84	2. 70
67. 1	3. 52	3. 55	3. 52	3. 52	3. 41	3 34	3. 31	3. 28	3. 03	2. 88
66. 9	3. 62	3. 62	3. 52	3. 52	3. 52	3 52	3. 52	3. 30	2. 96	2. 79
65. 5	3. 72	3. 67	3. 62	3. 62	3. 62	3. 57	3. 42	3. 50	3. 26	2. 85
67. 4	4. 03	3. 90	3. 83	3. 83	3. 79	3. 72	3. 64	3. 77	3. 43	3. 20
67. 5	3. 72	3. 87	3. 72	3. 72	3. 64	3. 57	3. 43	3. 58	3. 27	3. 10
64. 0	3. 83	3. 93	3. 86	3. 86	3. 62	3. 62	3. 62	3. 52	3. 57	3. 25
68. 1	4. 14	3. 93	3. 83	3. 83	3. 72	3. 72	3. 78	3. 67	3. 42	3. 15
Means= 66. 87	3. 767	3. 768	3. 708	3. 708	3. 675	3. 600	3. 544	3. 447	3. 300	3. 152

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 14.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9
82. 2	5. 54	6. 23	5. 77	5. 77	6. 23	5. 95	5. 57	5. 43	5. 27	5. 08
78. 5	5. 77	6. 04	6. 47	6. 32	6. 23	5. 84	5. 21	4. 85	5. 12	5. 04
74. 6	5. 54	5. 61	5. 77	6. 12	6. 23	5. 85	5. 58	5. 20	4. 86	4. 67
73. 5	5. 31	5. 31	5. 09	5. 25	6. 31	5. 77	5. 59	5. 23	4. 92	4. 78
69. 0	5. 54	5. 72	5. 22	4. 38	4. 38	4. 16	4. 38	4. 23	4. 14	3. 19
70. 9	5. 54	5. 12	5. 03	4. 98	5. 00	4. 95	4. 73	4. 61	4. 38	4. 28
71. 2	5. 08	5. 20	5. 27	5. 02	4. 85	5. 06	5. 63	5. 53	4. 44	4. 34
68. 0	5. 08	4. 93	4. 92	5. 05	4. 85	4. 85	4. 64	4. 73	4. 40	4. 23
60. 3	4. 38	4. 27	4. 31	4. 52	4. 52	4. 38	4. 24	4. 15	4. 00	3. 82
62. 3	4. 15	4. 13	4. 10	4. 15	4. 15	4. 13	3. 98	3. 83	3. 70	3. 54
62. 4	4. 38	4. 47	4. 27	4. 49	4. 38	4. 30	4. 27	4. 07	3. 92	3. 78
62. 1	4. 38	4. 38	4. 38	4 30	4. 27	4. 17	4. 22	4. 08	4. 04	3. 92
58. 7	4. 15	4. 15	4. 15	4. 15	4. 23	4. 37	4. 15	4. 15	3. 99	3. 66
59. 3	4. 04	4. 28	4. 28	4. 15	3. 97	4. 14	4. 34	4. 01	3. 75	3. 35
58. 5	4. 38	4. 38	4. 38	4. 38	4. 31	4. 27	4. 15	4. 11	3. 88	3. 74
57. 5	4. 15	4. 04	4. 04	4. 04	3. 97	3. 92	3. 92	3. 91	3. 80	3. 78
61. 1	4. 24	3. 99	3. 99	3. 86	3. 83	3. 83	3. 83	3. 77	3. 64	3. 62
61. 9	4. 03	3. 67	3. 67	3. 62	3. 52	3. 41	3. 50	3. 48	3. 23	3. 02
61. 0	3. 72	3. 72	3. 72	3. 65	3. 62	3. 71	3. 62	3. 57	3. 48	3. 21
61. 0	3. 83	3. 83	3. 74	3. 55	3. 52	3. 60	3. 48	3. 62	3. 54	3. 41
60. 5	4. 03	3. 79	3. 58	3. 72	3. 65	3. 53	3. 59	3. 47	3. 27	3. 11
59. 4	3. 62	3. 58	3. 37	3. 37	3. 49	3. 42	3. 30	3 21	3. 16	3. 03
57. 9	3. 62	3. 59	3. 48	3. 52	3. 41	3. 41	3. 32	3. 19	2 97	2. 85
57. 0	3. 62	3. 38	3. 27	3. 33	3 21	3. 28	3. 23	3. 00	2. 89	2. 76
58. 9	3. 31	3. 31	3. 31	3. 26	3. 21	3. 21	3. 10	3. 08	3. 00	2. 87
58. 4	3. 31	3. 31	3. 31	3 26	3. 21	3. 03	3. 00	2. 88	2. 79	2. 69
58. 0	3. 21	3. 21	3. 18	3. 10	3. 17	3. 04	2. 90	2. 78	2. 69	2. 65
60. 2	3. 41	3. 21	3. 35	3. 41	3. 33	3. 21	3. 10	3. 06	3. 00	2. 92
62. 5	3. 21	3. 21	3. 31	3. 41	3. 21	3. 18	3. 10	3. 03	3. 00	2. 98
61. 1	3. 31	3. 31	3. 31	3. 24	3. 21	3. 20	3. 10	3. 05	3. 00	2. 90
61. 2	3. 62	3. 50	3. 41	3. 34	3. 40	3. 40	3. 31	3. 25	3. 21	3. 08
61. 0	3. 62	3. 50	3. 41	3. 41	3. 32	3. 31	3. 28	3. 21	3. 21	3. 10
61. 2	3. 31	3. 31	3. 27	3. 21	3. 21	3. 09	3. 00	2. 94	2. 81	2. 59
61. 1	3. 31	3. 29	3. 21	3. 21	3. 11	3. 10	3. 07	3. 00	2. 84	2. 48
60. 8	3. 21	3. 21	3. 16	3. 10	3. 10	2. 99	2. 90	2. 84	2. 72	2. 60
59. 4	3. 10	3. 10	3. 10	3. 10	3. 10	3. 10	3. 00	2. 97	2. 85	2. 79
60. 0	3. 00	3. 00	3. 00	3. 00	3. 00	2 90	2. 90	2. 85	2. 79	2. 63
60. 2	3. 41	3. 25	3. 41	3. 41	3. 41	3. 31	3. 21	3. 16	3. 10	3. 02
60. 0	3. 31	3. 29	3. 17	3. 10	3. 19	3. 21	2. 98	2. 82	2. 63	2. 42
60. 0	3. 10	3. 10	3. 10	3. 02	3. 17	3. 21	2. 95	2. 65	2. 53	2. 40
60. 1	3. 41	3. 31	3. 31	3. 25	3. 12	3. 10	3. 08	3. 00	2. 75	2. 51
59. 4	3 31	3 29	3. 17	3. 22	3. 31	3. 02	2. 90	2. 87	2. 69	2. 51
55. 2	3. 41	3. 51	3. 41	3 41	3. 37	3. 26	3. 14	3. 10	3. 02	3. 00
60. 2	3. 41	3. 29	3. 25	3. 37	3. 33	3. 21	2. 95	2. 84	2. 71	2. 50
61. 2	3. 41	3. 31	3. 25	3. 21	3. 11	3. 11	3. 14	2. 96	2. 87	2. 59
59. 9	3. 41	3. 58	3. 27	3. 46	3. 50	3. 41	3. 17	2. 96	2. 90	2. 90
60. 0	3. 41	3. 52	3. 45	3. 48	3. 52	3. 62	3. 46	3. 17	3. 04	2. 96
62. 1	3. 62	3. 62	3. 48	3. 55	3. 52	4. 41	3. 41	3. 34	3. 31	3. 19
63. 5	3. 62	3. 65	3. 62	3. 45	3. 42	3. 41	3. 21	3. 21	3. 10	3. 06
62. 9	3. 62	3. 70	3. 67	3. 60	3. 52	3. 49	3. 36	3. 21	3. 18	2. 90
61. 5	3. 83	3. 72	3. 57	3. 55	3. 61	3. 38	3. 36	3. 14	3. 10	2. 78
Means = 62. 33	3. 917	3. 894	3. 846	3. 820	3. 820	3. 749	3. 656	3. 545	3. 405	3. 255

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 16.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9
80.0	6.81	7.55	7.84	8.03	7.65	6.93	7.36	7.72	6.73	5.82
80.8	7.39	7.04	6.96	6.73	6.75	7.05	7.16	6.86	6.48	6 23
79.0	6.93	6.86	6.93	7.44	6.93	6.93	6.58	6.27	5.72	5.00
78.8	7.39	6.85	7.05	6.80	6.28	6.66	6.34	5.99	5.70	5.23
77.9	6.70	7.06	7.67	7.77	7.39	7.20	6.62	6.25	6.43	5.70
75.0	6.47	6.64	6.70	6.98	6.93	6.47	6.81	6.70	6.93	5.99
73.2	6.23	6.23	6.23	6.23	6.23	6.32	6.05	5.60	5.55	5.27
72.5	6.00	5.89	6.19	6.23	6.62	5.67	5.63	5.31	5.17	4.84
70.7	5.77	5.65	5.60	5.62	5.92	5.74	5.31	5.11	4.92	4.67
62.0	5.08	5.31	5.31	5.47	5.54	5.36	4 61	4.45	4.38	4.12
63.0	3.92	5.20	5.02	4.98	5.31	5.23	4.95	4.65	4.35	4.12
57.0	4.04	3.92	3.92	3.87	3.74	3.54	3.28	3.11	2.87	2.76
53.0	4.38	4.37	4.15	4.13	4.02	3.88	3.76	3.69	3.57	3.46
58.9	3.92	4.36	4.23	4.10	3.95	4.03	3.92	3.77	3.64	3.57
56.0	3.92	3.92	3.92	3.96	3.98	3.92	3.87	3.69	3.47	3.40
56.0	4.15	4.23	4.02	3.97	3.98	4.06	4.08	4.04	3.82	3.68
57.0	3.92	3 89	3.72	3.75	3.82	3.84	3.80	3.57	3.53	3.14
55.7	4.03	3.92	3.92	3.92	3.82	3.69	3.69	3.69	3.58	3.57
49.5	3.83	3.93	3.83	3.73	3.72	3.63	3.53	3.42	3.32	3 31
53.0	3.62	3 71	3.61	3.50	3.44	3.49	3.41	3.37	3.26	3.15
48.0	3.62	3.62	3.62	3.33	3.43	3.33	3.23	3.21	3.21	3.21
47.5	3.41	3 62	3.53	3.52	3.52	3.44	3.41	3.41	3.41	3.27
46.9	3.11	3.61	3.62	3.62	3.62	3.55	3.45	3.41	3.35	3.25
49.5	3.00	3.00	3.10	3 00	2.90	2.99	3.20	3.01	2.62	3.21
47.0	3.00	3.09	3.20	3.21	3.05	3.00	3.00	2.94	2.90	2.85
47.4	3.00	3.39	3.13	3.02	3.08	3.03	2.86	2.92	2.76	2.48
46.0	3.21	3.19	3.12	3.18	3.07	3.00	3.11	3 12	2.96	2.82
47.0	3.21	3.30	3 31	3.23	3.29	3.09	2.94	2.84	2.74	2.64
44.5	3.41	3 13	3.02	3.00	2.94	2.95	3.00	2.91	2.57	2.38
51.1	3.10	3.10	3.10	3.10	3.09	3.00	3.00	2.99	2.88	2.77
48.5	3.79	2.99	2.80	2.98	2.82	2.71	2.61	2.43	2.30	2 20
49.0	3.21	3.10	3.10	2.91	2.90	2.80	2.79	2.70	2 69	2.61
48.5	3.00	2.99	2.89	2.80	2.97	2.82	2.71	2.69	2.61	2.59
49.5	3.10	3.00	3.00	3.00	3.00	3 00	3.00	2.91	2.61	2.49
47.2	3.21	3.11	3.01	2.92	2.82	2.72	2.63	2.59	2.59	2.33
48.0	3.21	3 21	3.11	2.83	2.97	3.00	3.00	3.00	2.72	2.32
48.9	3.00	2.79	2.90	2.90	2.90	2.80	2.52	2.40	2.38	2.30
47.4	3.00	3.00	3.00	3.00	3 00	3.00	3.00	3.00	2.94	2.84
45.4	2.79	2.79	2.88	2.90	2.96	2.94	2.94	2.88	2.66	2.07
44.9	3.00	3.00	3.00	3.00	3.00	2.95	2.83	2.81	2.57	2.47
49.0	3.00	3 00	3.00	3.00	3.00	2.91	2.90	2.81	2.62	2 42
48.1	3.31	3.21	3 21	3.02	2.81	2.71	2.69	2.62	2.59	2.52
49.1	3.10	3.00	2.90	2.90	2.80	2 70	2.60	2.49	2.39	2 30
45.5	3.00	3.01	3.08	2.93	2.83	2.79	2.74	2.65	2.59	2.51
48.0	3.10	3.10	3.01	2.91	2.90	2.81	2.79	2 72	2.62	2.46
44.5	3.31	3.31	3.23	3.14	3.04	2.96	2 90	2.90	2.89	2.79
47.1	3.21	3.21	3.21	3.04	3 08	3.03	2.94	2.84	2.68	2.34
46.1	3.31	3.40	3.24	3.13	3.10	3.10	3.10	3.02	2 82	2.68
45.4	3.41	3.51	3.35	3.24	3.14	3.10	3.06	2 97	2 87	2.77
46.5	3.41	3.41	3.24	3.29	3 24	3.21	3.15	3.05	2.96	2.85
45.2	3.41	3.41	3.50	3.37	3.31	3.31	3.27	3.21	3.19	3.09
45.5	3.62	3.53	3.60	3.55	3.39	3 26	3.26	3.27	3.18	3.05
49.7	3.62	3.72	3.41	5.41	3.41	3.31	3.21	3 10	3.00	2.91
46.1	3.72	3.72	3.55	3.52	3.32	3.21	3.10	3.00	2.93	2.75
Means=53.65	3.989	4.002	3.976	3.941	3.902	3.318	3.735	3.631	3.484	3.269

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 18.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9
67.0	7.22	7.47	7.46	7.45	7.64	7.62	7.27	7.29	6.90	7.42
65.0	6.93	7.16	7.30	7.49	6.90	6.64	6.48	6.34	6.14	5.83
67.5	7.62	7.17	6.90	7.23	6.60	6.50	6.69	6.62	6.24	5.85
64.0	6.93	6.93	6.93	6.93	6.91	6.70	6.62	6.47	6.32	6.23
63.1	7.04	6.70	6.70	6.70	7.12	6.31	6.06	6.33	6.08	5.65
60.5	5.77	5.77	5.68	5.54	5.54	5.54	5.48	5.18	4.93	5.25
61.0	5.77	5.54	5.64	5.62	5.33	4.84	4.73	4.80	4.67	4.39
58.1	5.77	5.10	5.16	4.85	5.15	5.31	4.86	4.82	4.54	4.38
56.0	5.31	5.05	4.85	4.76	5.73	4.77	4.64	4.81	4.35	4.14
52.0	4.85	4.95	4.58	4.40	4.47	4.33	4.20	4.25	3.84	3.65
49.2	4.96	5.08	5.31	5.20	5.30	5.70	4.97	4.86	4.64	4.52
45.5	5.19	5.08	5.08	4.91	5.14	5.18	4.98	4.76	4.58	4.48
44.0	4.61	4.61	4.43	4.38	4.26	4.23	4.32	4.15	4.14	3.94
40.0	3.69	3.69	3.96	3.95	3.78	4.15	3.79	3.69	3.61	3.42
40.9	3.57	3.31	3.08	2.99	3.06	3.22	3.02	2.92	2.82	2.72
39.9	3.92	4.01	3.83	3.73	3.82	3.69	3.87	3.79	3.60	3.39
41.0	3.92	3.92	3.92	3.87	3.83	3.89	3.71	3.52	3.39	3.27
40.6	3.69	3.88	3.85	3.85	3.86	3.66	3.29	3.23	3.11	2.92
40.4	3.92	3.82	3.80	3.74	3.69	3.70	3.98	3.60	3.30	3.21
39.6	3.69	3.69	3.69	3.64	3.55	3.46	3.37	3.34	3.22	2.95
40.0	3.46	3.46	3.46	3.41	3.34	3.34	3.06	2.99	2.90	2.71
42.9	3.62	3.44	3.33	3.37	3.41	3.29	2.97	2.79	2.70	3.62
44.0	3.41	3.32	3.31	3.25	3.10	2.92	2.79	2.76	2.58	2.40
43.0	3.41	3.41	3.34	3.31	3.27	3.15	3.00	3.00	2.91	2.82
39.0	3.21	3.21	3.21	3.17	3.08	3.00	2.76	2.69	2.65	2.57
40.8	3.00	3.00	2.94	2.85	2.76	2.70	2.78	2.65	2.53	2.44
39.5	3.21	3.05	3.00	2.92	2.74	2.50	2.48	2.32	2.22	2.06
36.1	2.90	2.90	2.85	2.79	2.79	2.54	2.38	2.38	2.38	2.21
37.9	2.59	2.59	2.59	2.59	2.59	2.59	2.59	2.46	2.18	2.34
37.5	3.21	3.05	2.90	2.79	2.79	2.64	2.54	2.48	2.48	2.41
36.5	2.90	2.90	2.85	2.79	2.79	2.72	2.65	2.58	2.50	2.42
34.0	3.10	3.03	2.89	2.69	2.69	2.65	2.57	2.43	2.34	2.27
31.2	2.79	2.79	2.79	2.79	2.79	2.79	2.79	2.72	2.59	2.59
33.0	2.59	2.72	2.79	2.79	2.79	2.70	2.49	2.55	2.41	2.00
37.0	2.79	2.95	2.90	2.79	2.79	2.72	2.65	2.59	2.59	2.41
38.5	2.69	2.93	2.95	2.80	2.58	2.50	2.42	2.38	2.36	2.29
35.1	2.79	2.79	2.79	2.79	2.79	2.74	2.67	2.60	2.59	2.50
35.9	3.00	3.00	2.91	2.79	2.79	2.79	2.75	2.59	2.59	2.49
34.5	2.79	2.65	2.50	2.40	2.62	2.55	2.38	2.38	2.22	2.01
34.5	2.59	2.59	2.55	2.47	2.40	2.38	2.37	2.30	2.22	2.15
32.1	3.00	2.73	2.59	2.59	2.53	2.46	2.40	2.38	2.37	2.31
34.0	2.69	2.69	2.65	2.59	2.59	2.55	2.47	2.40	2.34	2.27
34.0	2.90	2.83	2.79	2.78	2.65	2.55	2.46	2.33	2.14	1.92
33.0	2.79	2.79	2.79	2.79	2.66	2.53	2.39	2.32	2.25	2.18
32.0	3.00	3.00	3.00	3.00	2.88	2.75	2.62	2.54	2.47	2.36
35.0	2.90	2.90	2.82	2.68	2.61	2.54	2.46	2.39	2.25	2.11
33.1	3.21	3.07	3.00	3.00	3.00	2.90	2.70	2.63	2.53	2.39
32.1	3.10	3.04	2.94	2.81	2.79	2.75	2.62	2.54	2.45	2.28
33.2	3.21	3.21	3.14	3.00	2.86	2.79	2.79	2.73	2.66	2.59
34.5	3.31	3.23	3.13	2.98	2.84	2.71	2.58	2.50	2.33	2.10
33.8	3.00	3.00	3.00	3.00	2.85	2.71	2.58	2.51	2.40	2.26
33.0	3.31	3.38	3.38	3.23	3.21	3.12	2.91	2.71	2.56	2.49
34.1	3.41	3.34	3.27	3.20	3.06	2.91	2.78	2.71	2.65	2.58
33.2	3.41	3.41	3.38	3.31	3.24	3.17	3.10	3.04	2.93	2.79
34.5	3.52	3.44	3.37	3.30	3.15	3.10	3.07	2.93	2.84	2.77
35.0	3.62	3.55	3.48	3.39	3.04	3.11	2.98	2.91	2.83	2.74
34.0	3.62	3.46	3.41	3.39	3.27	3.08	2.87	2.66	2.59	2.59
Means=41.36	3.832	3.786	3.739	3.689	3.628	3.540	3.424	3.345	3.210	3.088

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 20.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9
53.9	5.89	6.44	6.95	7.20	6.91	6.92	6.97	6.40	5.67	5.69
52.0	6.29	6.47	6.54	6.79	7.07	7.20	7.27	6.99	6.70	6.36
53.0	6.35	6.58	6.63	7.00	7.22	7.03	6.88	6.77	6.64	6.52
52.8	6.47	6.58	6.65	6.75	6.47	6.41	6.37	6.54	6.42	6.29
53.0	6.47	6.47	6.47	6.44	6.22	6.07	6.19	6.03	5.77	5.77
54.5	6.47	6.23	6.21	6.11	6.02	5.97	6.07	6.23	6.04	5.81
49.5	6.47	6.47	6.24	6.23	6.45	6.24	6.45	6.25	6.23	6.02
48.5	5.77	6.23	6.02	6.64	6.30	6.63	6.33	6.23	6.05	5.82
45.0	5.08	5.50	5.36	5.39	5.63	5.31	4.85	4.85	4.85	4.85
45.0	5.31	5.20	4.92	5.09	5.33	5.13	5.03	5.23	5.00	4.55
45.0	4.85	4.95	4.88	4.53	4.52	4.61	4.61	4.54	4.34	4.13
36.0	4.85	4.85	4.75	4.56	4.42	4.25	4.07	3.90	3.74	3.58
36.0	4.38	4.38	4.27	4.17	4 25	4.20	4.15	4 14	3.97	3.92
38.9	4.38	4.56	4.61	4.50	4.26	4.17	4.08	4.04	4.01	3.92
35.1	4.61	4.61	4.57	4.49	4.40	4.32	4.22	4.06	4.11	4.11
29.0	3.46	3.46	3.42	3.30	3.18	3.12	3.05	2.97	2.84	2.72
28.0	3.92	3 85	3.76	3.57	3.43	3.36	3.38	3.45	3.08	2.96
29.0	3.46	3.60	3.69	3.69	3.61	3.48	3.46	3.46	3.46	3.40
28.0	3.80	3.74	3.69	3.69	3.66	3.59	3.53	3.47	3.29	3.10
26.2	3.69	3.69	3.69	3.69	3.67	3.55	3.44	3.38	3.26	3.03
26.2	3.34	3.34	3.34	3.28	3.18	2.94	2.76	2.69	2.63	2.56
28.5	3.52	3.38	3.29	3.23	3.15	3.03	2.83	2.60	2.35	2.10
28.0	3.31	3.31	3.28	3.17	3.05	2.94	2.86	2.80	2.74	2.69
26.0	3.00	3.00	2.99	2.88	2.78	2.73	2.68	2.63	2.56	2.47
24.3	3.21	3 11	3.01	2.90	2 80	2.79	2.79	2.71	2.60	2.49
23.9	2.59	2.59	2.59	2.50	2.40	2.34	2.29	2.17	2.02	1.86
23.8	2.59	2.59	2.59	2.59	2.59	2.51	2.41	2.31	2.21	2.11
24.0	2.48	2.43	2.38	2.42	2.41	2.44	2.39	2.38	2.38	2.30
23.1	2.59	2 54	2.49	2.44	2.40	2.38	2.38	2.36	2.31	2.26
23.0	2.69	2.59	2.50	2.44	2.40	2.32	2.22	2.15	2.10	2.06
21.0	2.38	2.38	2.38	2.33	2.24	2.15	2.06	1.97	1.84	1.70
20.5	2.59	2.59	2.59	2.59	2.59	2.57	2.45	2.32	2.23	2.15
22.0	2.79	2.70	2.61	2.55	2.51	2.46	2.42	2.36	2.27	2.16
23.1	2.59	2.64	2.68	2.57	2.43	2.28	2.13	2.04	1.99	1.94
22.8	2.38	2.43	2.47	2.44	2.40	2.26	2.07	1.92	1.83	1.74
21.9	2.59	2.50	2.41	2.31	2.22	2.17	2.17	2.16	2.12	2.08
22.5	2.38	2.33	2.29	2.21	2.11	2.04	1.99	1.89	1.71	1.53
24.5	2.48	2.53	2.59	2.49	2.39	2.29	2.18	2.17	2.17	2.08
22.9	2.28	2.37	2.46	2.44	2.40	2.26	2.07	1.90	1.75	1.61
20.4	2.38	2.38	2.38	2.33	2.25	2.16	2.08	1.99	1.92	1.85
20.6	2.38	2.38	2.38	2.33	2.24	2.17	2.17	2.17	2.12	2.05
19.9	2.59	2.55	2.50	2.40	2.24	2.07	1.95	1.83	1.71	1.60
20.0	2.59	2.59	2.59	2.55	2.46	2.38	2.21	2.04	1.89	1.76
20.2	2.48	2.48	2.48	2.46	2.42	2.38	2.34	2.30	2.24	2.16
20.5	2.48	2.44	2.40	2.33	2.25	2.16	2.12	2 08	1.98	1.67
19.2	2.59	2.59	2.59	2.56	2.48	2.40	2.35	2.31	2.27	2.23
20.8	2.48	2.48	2.48	2.46	2.41	2.36	2.33	2.10	1.98	1.92
19.8	2.69	2.65	2.61	2.59	2.53	2.50	2.44	2.40	2.35	2.29
22.5	2.79	2.70	2.61	2.55	2.50	2.43	2 34	2.25	2.15	2.06
21.1	3.00	2.91	2.82	2.76	2.72	2.66	2.53	2.39	2.34	2.30
20.1	3.00	2.92	2.83	2.77	2.73	2.67	2.60	2.52	2.45	2.40
20.8	3.00	2.91	2.83	2.77	2.72	2.67	2.59	2.50	2.43	2.36
20.3	3.31	3.35	3.39	3.37	3.29	3.20	3.03	2.86	2.71	2.57
22.5	3.52	3.43	3.33	3.27	3.23	3.18	3.19	2.87	2.79	2.71
21.5	3.62	3 57	3.53	3.48	3.44	3.35	3.21	3.10	3.02	2.93
22.0	3.41	3.37	3.32	3.28	3.23	3.15	3.01	2.88	2.74	2.60
Means=29.33	3.608	3.623	3.595	3.569	3.511	3.435	3.356	3.268	3.149	3.034

Velocities in feet per second at each tenth of depth, &c.--Continued.

STATION 22.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9
44.0	5.42	5.88	6.08	6.65	6.78	6.57	6.39	6.16	6.05	5.91
45.0	6.23	6.19	6.11	6.03	5.93	5.89	5.89	5.92	5.88	5.57
45.5	6.12	5.92	6.07	6.55	6.99	7.03	6.83	6.61	6.41	6.20
45.5	6.00	6.52	6.68	6.88	6.93	6.67	6.36	6.14	5.94	5.70
43.8	6.00	6.29	6.26	6.32	6.17	6.00	5.93	5.79	5.89	5.00
45.5	6.00	6.32	6.16	6.21	6.27	5.89	5.92	5.88	5.68	4.42
46.0	6.23	6.13	5.93	5.71	5.88	6.00	5.93	5.87	5.72	5.61
42.5	6.23	6.23	6.23	6.30	6.35	5.89	6.47	6.47	6.44	6.17
42.5	5.77	6.06	6.04	5.87	5.77	6.00	5.63	6.20	5.86	5.77
42.5	5.77	5.77	5.25	5.60	6.28	6.38	6.69	5.93	5.79	5.77
42.0	5.54	5.92	5.83	5.65	5.46	5.72	5.18	4.68	4.28	4.40
40.0	4.38	5.11	5.17	5.08	4.91	6.72	4.33	4.38	4.58	4.90
38.1	5.08	5.61	5.53	5.23	5.07	5.28	4.72	4.53	4.35	4.17
35.8	4.85	4.85	4.65	4.38	4.38	4.15	4.45	4.85	4.17	3.60
35.8	4.38	4.46	4.54	4.43	4.20	4.90	4.24	3.92	3.83	3.75
30.0	4.61	4.47	4.38	4.38	4.07	4.32	3.55	3.43	3.37	3.30
29.9	4.61	4.61	4.55	4.43	4.33	4.28	4.33	3.34	4.20	4.05
30.0	4.15	4.22	4.27	4.27	4.18	3.69	3.97	3.90	3.80	3.75
29.5	4.27	4.33	4.38	4.38	4.30	4.27	4.03	3.90	3.83	3.76
29.0	4.38	4.64	4.78	4.51	4.30	4.04	3.99	3.78	3.58	3.40
21.0	2.99	3.09	3.19	3.17	3.07	4.16	2.87	2.77	2.66	2.55
21.0	3.69	3.69	3.69	3.60	3.45	4.17	3.16	3.01	2.85	2.69
21.5	3.46	3.36	3.26	3.23	3.23	2.97	3.09	2.99	2.82	2.66
20.8	3.69	3.59	3.50	3.43	3.38	3.30	3.17	3.02	2.63	2.70
21.1	3.34	3.29	3.25	3.20	3.15	3.19	2.99	2.89	2.80	2.72
20.1	3.23	3.27	3.32	3.29	3.20	3.31	3.06	3.01	2.87	2.40
20.0	2.88	2.88	2.88	2.86	2.81	3.08	2.72	2.67	2.61	2.53
19.5	2.23	3.14	3.04	2.99	2.99	3.11	2.91	2.82	2.74	2.67
19.0	2.88	2.83	2.79	2.76	2.76	2.76	2.70	2.61	2.51	2.28
23.5	3.62	3.52	3.42	3.33	3.23	3.10	2.96	2.81	2.66	2.52
22.2	3.21	3.21	3.21	3.21	3.21	3.09	2.86	2.65	2.40	2.17
20.9	2.79	2.79	2.79	2.79	2.79	2.78	2.74	2.70	2.63	2.56
17.2	2.90	2.90	2.90	2.79	2.75	2.72	2.67	2.56	2.46	2.35
18.1	3.21	3.05	2.92	2.76	2.65	2.54	2.42	2.30	2.19	2.10
17.0	2.38	2.31	2.24	2.17	2.09	2.02	1.94	1.80	1.66	1.53
16.2	2.17	2.17	2.17	2.17	2.05	1.92	1.78	1.62	1.45	1.28
15.0	1.96	2.06	2.15	2.25	2.26	2.23	2.19	2.12	1.96	1.80
15.2	1.96	2.06	2.09	2.15	2.10	2.01	1.91	1.83	1.75	1.68
14.5	1.86	1.86	1.86	1.86	1.84	1.81	1.79	1.75	1.67	1.59
16.9	1.96	1.96	1.96	1.96	1.89	1.82	1.75	1.66	1.57	1.49
15.5	2.07	2.10	2.13	2.16	2.12	2.05	1.99	1.93	1.88	1.83
16.0	2.38	2.31	2.25	2.18	2.06	1.92	1.79	1.59	1.37	1.14
17.4	2.17	2.17	2.17	2.16	2.05	1.94	1.85	1.82	1.78	1.75
17.1	2.17	2.21	2.25	2.27	2.16	2.05	1.95	1.92	1.91	1.85
15.9	2.17	2.17	2.17	2.17	2.14	2.11	2.08	2.01	1.92	1.72
16.5	1.96	1.96	1.96	1.96	1.93	1.89	1.86	1.75	1.64	1.52
15.5	2.17	2.17	2.17	2.17	2.15	2.11	2.08	1.98	1.84	1.66
17.1	2.07	2.03	1.99	1.95	1.89	1.82	1.74	1.59	1.45	1.31
15.1	1.96	1.96	1.96	1.96	1.92	1.86	1.80	1.70	1.54	1.38
14.8	1.86	1.89	1.92	1.95	1.92	1.86	1.80	1.74	1.66	1.58
15.1	1.76	1.76	1.76	1.76	1.68	1.55	1.42	1.30	1.18	1.10
15.3	1.96	1.96	1.96	1.96	1.94	1.91	1.88	1.82	1.75	1.65
15.5	2.28	2.25	2.21	2.18	2.15	2.11	2.08	2.04	1.98	1.92
15.2	2.38	2.32	2.25	2.19	2.12	2.06	2.00	1.94	1.89	1.80
15.0	1.76	1.79	1.82	1.85	1.84	1.81	1.78	1.74	1.69	1.63
15.2	1.86	1.83	1.80	1.77	1.74	1.70	1.67	1.63	1.58	1.53
16.1	2.17	2.14	2.11	2.07	2.04	2.00	1.97	1.87	1.77	1.66
16.1	2.07	2.03	2.00	1.96	1.93	1.90	1.87	1.86	1.86	1.70
16.2	2.38	2.38	2.38	2.38	2.25	2.12	1.98	1.86	1.76	1.65
16.1	2.38	2.38	2.38	2.38	2.35	2.32	2.29	2.21	2.13	2.04
15.8	2.59	2.56	2.52	2.49	2.43	2.36	2.30	2.25	2.21	2.16
16.4	2.69	2.62	2.55	2.48	2.45	2.42	2.38	2.30	2.25	2.13
16.8	2.90	2.83	2.76	2.69	2.66	2.62	2.59	2.52	2.45	2.37
17.0	2.90	2.86	2.83	2.79	2.75	2.72	2.68	2.61	2.54	2.47
18.8	2.69	2.65	2.61	2.58	2.53	2.49	2.45	2.42	2.38	2.34
Means = 24.08	3.372	3.414	3.391	3.374	3.333	3.251	3.181	3.087	2.937	2.836

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 24.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9
37.2	4.79	5.09	5.30	5.30	5.03	5.35	5.45	5.29	4.82	3.55
30.6	5.60	5.67	5.77	5.93	5.96	5.95	5.91	5.83	5.68	3.54
37.5	5.66	5.57	5.61	5.67	5.72	5.76	5.77	5.68	5.42	5.00
36.5	5.31	5.38	5.42	5.47	5.63	5.66	5.62	5.53	5.43	5.35
37.0	5.31	5.55	5.61	5.59	5.72	5.75	5.57	5.35	5.57	5.11
37.8	5.72	5.67	5.71	5.81	5.88	5.63	5.45	5.17	4.72	4.45
37.0	5.36	5.40	5.28	5.16	5.19	5.19	5.14	5.06	4.97	4.88
35.3	6.00	6.00	5.82	5.55	5.64	5.72	5.72	5.56	5.40	5.20
36.0	5.31	5.47	5.54	5.61	5.82	5.79	5.70	5.54	5.36	5.08
37.0	4.96	4.96	5.12	5.19	4.87	4.53	4.27	4.12	3.93	3.92
31.5	4.15	4.57	4.67	4.23	4.40	4.51	4.07	4.02	4.16	3.70
30.0	4.85	4.85	4.85	4.85	4.74	4.61	4.47	4.28	4.02	3.78
28.4	4.61	4.47	4.38	4.38	4.31	4.28	4.12	3.93	3.66	3.40
22.0	4.38	4.33	4.28	4.23	4.18	4.13	4.08	4.03	3.98	3.92
22.9	4.27	4.32	4.37	4.38	4.38	4.28	4.13	4.02	3.96	3.91
22.0	4.04	4.04	4.04	4.01	3.95	3.88	3.84	3.77	3.63	3.47
20.0	3.46	3.46	3.46	3.44	3.38	3.34	3.25	3.15	3.03	2.88
13.8	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.00
14.0	2.30	2.30	2.30	2.30	2.26	2.16	2.06	1.96	1.88	1.80
14.8	2.53	2.53	2.53	2.53	2.49	2.42	2.35	2.28	2.19	2.10
14.5	2.30	2.30	2.30	2.30	2.34	2.40	2.47	2.50	2.16	1.83
14.0	2.30	2.30	2.30	2.30	2.27	2.21	2.14	2.08	1.93	1.77
13.1	2.18	2.18	2.18	2.18	2.17	2.15	2.12	2.19	2.06	2.03
12.2	2.07	2.10	2.12	2.15	2.18	2.13	2.07	2.12	1.96	1.90
12.2	2.18	2.15	2.13	2.10	2.07	2.04	2.01	1.99	1.96	1.93
12.2	2.53	2.50	2.47	2.44	2.42	2.33	2.20	2.09	1.97	1.80
14.9	2.59	2.59	2.59	2.59	2.49	2.34	2.18	2.02	1.87	1.71
41.6	2.38	2.38	2.38	2.38	2.33	2.24	2.15	2.06	1.98	1.90
13.5	1.96	1.96	1.96	1.96	1.94	1.85	1.77	1.68	1.60	1.52
12.1	1.86	1.84	1.81	1.79	1.76	1.74	1.71	1.68	1.66	1.63
10.2	1.76	1.72	1.67	1.63	1.59	1.55	1.51	1.48	1.44	1.41
9.5	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.04	0.94
8.9	1.24	1.19	1.15	1.10	1.05	1.03	1.03	1.03	1.00	0.90
8.4	1.55	1.51	1.47	1.41	1.38	1.32	1.24	1.15	1.07	0.98
9.0	1.76	1.67	1.57	1.48	1.38	1.31	1.25	1.25	1.13	1.06
9.3	1.34	1.29	1.25	1.20	1.15	1.10	1.05	0.98	0.89	0.79
8.0	1.34	1.30	1.26	1.22	1.18	1.14	1.10	1.05	1.01	0.96
10.1	1.45	1.41	1.37	1.32	1.28	1.24	1.19	1.14	1.09	1.04
10.1	1.45	1.43	1.41	1.38	1.36	1.34	1.29	1.24	1.19	1.14
10.2	1.34	1.30	1.26	1.22	1.18	1.15	1.20	1.21	1.18	1.13
10.1	1.34	1.32	1.30	1.28	1.26	1.24	1.19	1.14	1.09	1.04
10.1	1.34	1.34	1.34	1.34	1.34	1.34	1.29	1.24	1.19	1.14
10.0	1.34	1.32	1.30	1.28	1.26	1.24	1.19	1.24	1.09	0.99
9.5	1.34	1.32	1.29	1.27	1.25	1.16	1.06	0.96	0.83	0.67
9.0	1.34	1.29	1.25	1.20	1.16	1.11	1.07	0.91	0.87	0.82
9.0	1.24	1.20	1.16	1.13	1.09	1.05	1.01	0.96	0.92	0.97
8.5	1.24	1.20	1.17	1.13	1.20	1.06	1.01	0.84	0.67	0.53
9.5	1.45	1.42	1.40	1.37	1.35	1.26	1.24	1.24	1.20	1.15
10.5	1.55	1.53	1.50	1.47	1.43	1.34	1.34	1.34	1.34	1.34
11.2	1.96	1.98	2.10	2.03	2.05	2.04	1.97	1.87	1.76	1.60
11.8	2.28	2.23	2.18	2.13	2.08	2.03	1.98	1.93	1.88	1.84
12.0	2.07	2.07	2.07	2.07	2.07	2.05	2.02	2.00	1.97	1.92
Means = 17.88	2.810	2.816	2.812	2.787	2.771	2.729	2.663	2.587	2.483	2.335

STATION 26.

23.2	3.75	3.82	3.85	4.00	4.15	4.20	4.18	4.08	3.88	3.60
22.5	3.54	3.61	3.65	3.62	3.53	3.48	3.46	3.40	3.27	3.14
23.5	3.80	4.14	4.45	4.45	4.40	4.37	4.35	4.22	4.02	3.80
23.5	3.98	4.10	4.18	4.26	4.33	4.22	4.10	4.10	4.17	4.10
24.8	4.04	4.16	4.27	4.38	4.50	4.22	3.93	3.78	3.64	3.50
23.8	4.15	4.34	4.48	4.47	4.45	4.50	4.45	4.38	4.29	4.15
24.9	3.98	4.13	4.26	3.99	3.69	3.93	4.15	3.94	3.70	3.40
23.2	4.04	4.09	4.14	4.15	4.15	4.15	4.15	4.04	3.82	3.61
22.4	4.15	4.15	4.15	4.11	4.04	4.01	3.96	3.90	3.85	3.80
22.5	3.92	3.92	3.92	3.83	3.73	3.63	3.53	3.43	3.33	3.23
22.0	3.80	3.80	3.80	3.91	4.07	4.06	3.86	3.67	3.57	3.47
18.5	3.92	3.92	3.92	3.90	3.90	3.90	3.82	3.65	3.48	3.31
17.5	3.46	3.46	3.46	3.45	3.42	3.38	3.34	3.31	3.26	3.20
16.0	2.99	2.99	2.99	2.99	3.09	3.20	3.37	3.20	3.02	2.83
15.0	2.99	2.99	2.99	2.99	2.99	2.99	2.99	2.99	2.99	2.99
9.9	3.46	3.46	3.46	3.46	3.23	3.00	2.78	2.54	2.38	2.00
8.9	2.30	2.30	2.30	2.30	2.30	2.27	2.22	2.17	2.12	2.06
8.8	2.07	2.07	2.07	2.03	1.98	1.93	1.88	1.83	2.78	2.73
Means = 19.49	3.574	3.636	3.686	3.683	3.664	3.636	3.584	3.479	3.421	3.273

Velocities in feet per second at each tenth of depth, &c.—Continued.

MEAN VALUES OF STATION MEANS.

No. of station.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9
2	3.441	3.450	3.457	3.407	3.346	3.283	3.239	3.217	3.127	2.969
4	2.716	2.733	2.729	2.698	2.668	2.571	2.495	2.423	2.339	2.243
6	3.112	3.136	3.103	3.091	3.090	2.991	2.908	2.816	2 677	2.527
8	3.438	3 435	3.434	3.454	3.405	3.336	3.246	3.160	3.041	2.917
10	3 622	3.657	3.696	3.719	3.675	3.649	3.525	3.448	3.310	3.079
12	3.767	3.768	3.727	3.708	3.675	3.600	3.544	3.447	3 300	3.152
14	3.917	3.894	3.846	3.820	3.820	3.749	3.656	3.545	3.405	3.255
16	3 989	4.002	3.976	3.941	3.902	3.818	3.735	3.631	3.484	3.269
18	3.832	3.786	3.739	3.681	3.628	3.540	3.424	3.345	3.210	3.088
20	3.608	3.623	3.595	3.569	3.511	3.435	3.356	3.268	3.149	3.034
22	3.372	3.414	3.391	3.374	3.333	3.251	3.181	3.087	2.937	2.836
24	2.810	2.816	2.812	2.787	2.771	2.729	2.663	2.587	2.483	2.335
26	3.574	3.636	3.686	3.683	3.664	3.636	3.584	3.479	3.421	3.273
Means =	3.477	3.488	3.476	3.456	3.422	3.353	3.274	3.189	3.068	2.921

MEAN VALUES OF ALL OBSERVATIONS.

Means =	3.466	3.475	3.458	3.439	3.405	3.332	3.249	3.161	3.034	2.890

5.—Red River Landing, Louisiana.

Office Mississippi River Commission,
Saint Louis, Mo., August 15, 1884.

Sir: I have the honor to submit a report on experimental work performed at Red River Landing and vicinity, by Assistant John Ewens, in the season 1881–'82.

The work embraced the following particulars: Determination of velocities in vertical planes; bend soundings and transverse velocity observations; experiments with the current meter.

Vertical velocities.—These observations were made during the period from July 12 to November 18, 1882, at stages ranging from 41 feet on the gauge, 8 feet below the high water of the year, down to 9 feet, the low water of the year. They are thirty-five in number, thirty-two of which were on the Mississippi section, distributed irregularly among thirteen of the fourteen velocity stations permanently located on the section. The remaining three were taken at one station on the Atchafalaya section.

The meter (Ellis, Nos. 5 and 7) was used throughout, and was run for one minute at each foot in depth descending; the series was not repeated in ascending.

The results are shown in detail on sheets Nos. 1–7, a plotted curve accompanying each table of velocities.* For the purpose of computing the mean velocities in some cases where observations were wanting, values were interpolated, and in all cases the probable curve of velocity was continued to the surface and to the bottom; portions thus obtained are denoted by dotted lines.

These curves were divided vertically into tenths, the velocities at the points so fixed were tabulated by stations, and the mean for each station computed and plotted. There results a series of thirteen station means, of eleven terms each. All the observations were then combined into a single vertical or grand mean. The station and grand means are shown on pages 8 and 9.

It will be observed that the surface velocity in most of these curves, and in the grand mean, is distinctly lower than that at the first tenth. To determine the form of the curve in this part, the first tenth of each curve was divided into fourths, and the mean velocity at the three intermediate points computed giving velocities at 1, 2, and 3 fortieths of depth, in addition to the tenths already determined. The resulting curve is the dotted line 1, 2, 3, shown in the double-scale curve in sheet No. 9. The form of this partial curve shows that the velocity is maintained nearer the surface than the main curve would imply, and leads to the suspicion that the apparently low surface velocity is the result of a constant error caused by running the meter too near the surface. (See, however, Catamaran experiment.)

Computation of the elements of the mean curve from three points makes the ratio of the semi-axis negative; the curve is therefore an ellipse, of which the axis (assumed parallel to the water-surface) lies at not more than one-thirtieth of the depth. The mean velocity is at about six-tenths of the depth.

* Not published.

The form of the Atchafalaya curve, as far as the data give it, does not appear to vary materially from that of the Mississippi, the maximum velocity being near the surface, and the mean somewhat below mid-depth.

Bend soundings.—The section selected was at Brunette Point, 17 miles below Red River Landing. Soundings were made and velocities observed six times, from May 30 to October 31. The results are presented graphically on pages 10 and 11. The section of October 31 was not plotted since, in the absence of instruments, the soundings were located by comparison with those of a previous date, and therefore have no independent value; the velocities, however, being doubtless located with sufficient exactness, were plotted for the sake of extending the comparison.

The gauge-readings given in the notes on this section being from the Red River Landing gauge, the elevation of water surface above Cairo datum was obtained by comparison of Red River and Port Hickey gauges, the latter being corrected for September 29 and October 31, when it was evidently in error, by reference to the Baton Rouge gauge and comparison of readings at the corresponding stages in 1883.

The locus of maximum velocity lies in the convex side of the river, where a noticeable fill is shown by the section of September 29, as the velocity decreased.

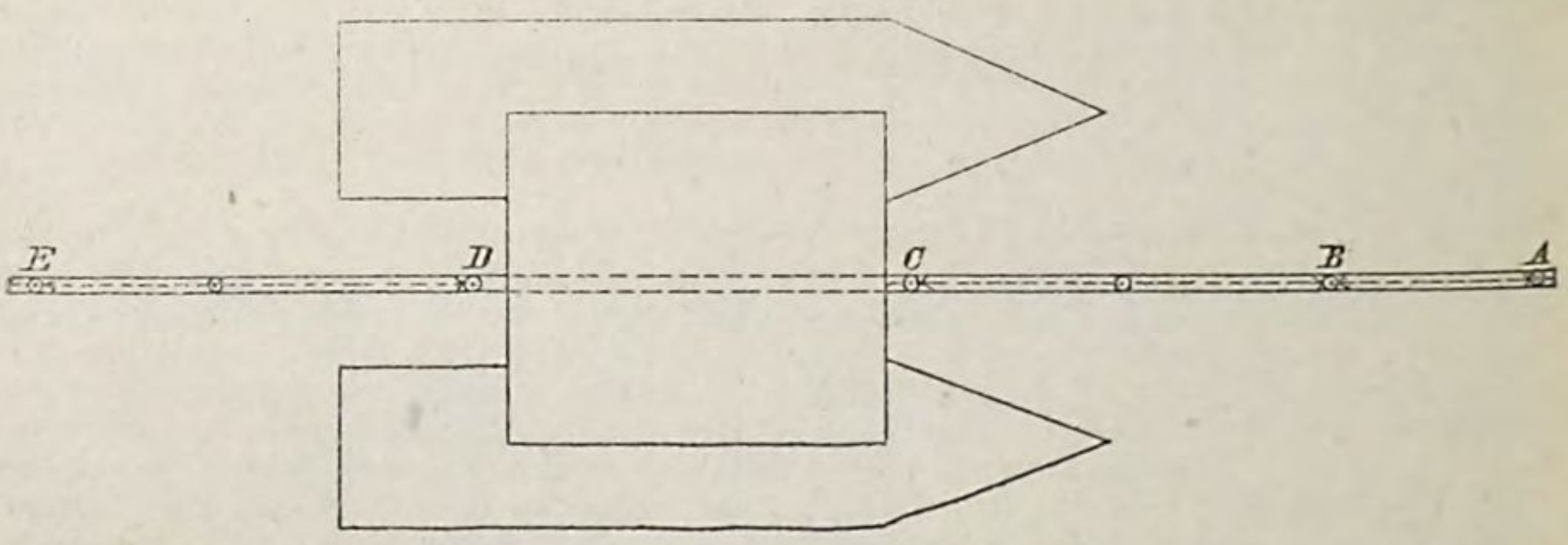
The velocities through this section were observed at depths varying from 3 to 35 feet, and for comparison have been reduced to mid-depth by using coefficients derived from the vertical curves at Carrollton, where the conditions are somewhat similar.

In order to compare the flow at this section with that at Red River Landing for the same dates the discharges were computed, with the following results:

Date.	Gauge at Red River Landing.	Brunette Bend.		Red River Landing.		Excess at Brunette Bend.	
		Mean velocity.	Discharge.	Mean velocity.	Discharge.	Cubic feet.	Per cent.
May 30	41.31	5.38	1,245,224	4.93	1,135,082	110,142	9.7
June 27	41.70	5.42	1,228,480	4.64	1,092,263	136,217	12.5
July 25	40.00	4.86	1,074,400	4.28	982,434	91,966	9.4
August 9	32.10	3.63	733,791	3.33	649,672	84,099	13.0
September 29	14.36	2.60	383,400	2.53	309,557	73,843	23.8

These differences seem to indicate that in sections of this character, where the main flow of the river sets across the convex and shoaler side of the bend, the mean velocity in the deeper part of the section cannot safely be assumed to be the same function of the mid-depth velocity as in straight reaches. Naturally the percentage of low-water excess follows the increased ratio of the volume below a given subsurface plane to the whole volume of the river.

In order to determine the effect of the catamaran skiffs on the current near the surface, a series of fourteen runs of sixty seconds each was made at the depth of 1½ feet at each of the points indicated in the following diagram, the results being given in the accompanying table:



REGISTRATION.

A.	B.	C.	D.	E.
25. 27	26. 25	24. 25	26. 26	25. 25
25. 25	27. 25	23. 25	27. 27	26. 26
25. 26	25. 26	25. 24	29. 27	27. 26
24. 26	27. 27	24. 27	25. 26	27. 27
25. 26	24. 25	26. 26	25. 25	24. 25
26. 25	26. 25	25. 26	25. 24	24. 25
27. 27	25. 26	27. 27	25. 27	25. 25
Mean = 25. 64	25. 64	25. 29	26. 00	25. 50

Assuming that the extent of the experiment (14 minutes) would eliminate errors arising from fluctuations of the current, the means of this table point to a small retardation between the skiffs forward and an acceleration aft. It is possible that the low surface velocity noticed in the vertical curves may be in some degree due to interference from this source, which would be more marked in approaching the surface.

Ellis meter No. 5 was rated once and No. 7 twice early in August. The rating of No. 7 of August 9 was used for all observations made with that instrument; the rating used for No. 5 was that taken at Saint Louis, Mo., November 10, 1881.

METER RATINGS.

[$y=ax+b$, in which y = velocity in feet per second; x=registrations per minute.]

Locality.	Date.	Meter.	Number of observations.	Registrations per revolution.	Course.	Constants.		Authority.	Range of velocities.	Where taken.
						a.	*b.*			
	1881.				*Feet.*					
Saint Louis, Mo	Nov. 10	Ellis No. 5.	18	1	150	.06245	.148	J. Ewens..	1. 17-9. 49	Reservoir.
	1882.									
Red River Landing .	Aug. 3	Ellis No. 5.	12	1	150	.06350	.002	..do	1. 45-6. 36	Lake.
Do	Aug. 4	Ellis No. 7.	9	1	150	.06346	.045	..do	2. 78-9. 15	Do.
Do	Aug. 9	Ellis No. 7	12	1	150	.06216	.177	..do	1. 56-7. 35	Do.

Tracings of the locations of the various sections are appended.

Very respectfully, your obedient servant,

E. H. TWINING.

First Lieut. SMITH S. LEACH,
Corps of Engineers, U. S. A.,
Secretary Mississippi River Commission.

Velocities in feet per second at each tenth of depth as resulting from the velocity observations made at Red River Landing, La., in 1882.

STATION 1.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
54. 0	2. 13	2. 75	2. 77	2. 73	2. 68	2. 45	2. 63	2. 60	2. 51	2. 56	**2. 19**

STATION 2.

51	2. 80	3. 21	3. 21	3. 14	3. 17	3. 05	2. 86	3. 08	2. 96	3. 02	2. 30
34	2. 40	2. 50	2. 54	2. 52	2. 30	2. 46	2. 25	2. 21	2. 16	1. 88	1. 50
Means = 42. 5	2. 60	2. 86	2. 88	2. 83	2. 74	2. 76	2. 56	2. 64	2. 56	2. 45	1. 90

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 3.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
30	2.52	2.71	2.65	2.71	2.77	2.65	2.52	2.71	2.46	2.40	2.00
31	2.33	2.84	2.96	2.82	2.84	2.87	2.90	2.52	2.55	2.64	2.00
Means = 30.5	2.42	2.78	2.80	2.76	2.80	2.76	2.71	2.62	2.50	2.52	2.00

STATION 4.

40.0	4.15	4.08	4.08	3.90	3.84	3.52	3.52	3.58	3.52	3.21	2.70

STATION 5.

38	2.84	3.07	3.04	2.90	3.07	2.84	2.65	2.20	1.96	1.97	1.20
35	2.77	3.02	3.02	2.96	2.84	2.74	2.46	2.28	1.90	1.52	1.00
34	2.65	2.75	2 80	2.76	2.70	2.40	2.31	1.94	1.65	1.27	0.60
34	2.46	3.01	2.92	2.90	2.80	2.71	2.44	2.36	2.01	1.68	1.15
23	2.54	2.87	2.91	2.94	2.85	2.78	2.76	2.80	2.60	2.51	2.20
24	2.47	2.88	2.93	2.78	2.88	2.70	2.78	2.78	2.45	2.29	1.90
25	2.54	2.91	2.91	2.90	2.91	2.80	2.78	2.52	2.41	2.13	1.85
Means = 30.4	2.61	2.97	2.97	2.89	2.86	2.71	2.60	2.41	2.14	1.91	1.41

STATION 6.

41.0	3.02	3.02	2.96	2.95	2.89	2.65	2.60	2.58	2.20	2.11	1.60

STATION 7.

35.0	2.84	2.78	2.65	2.62	2.52	2.42	2.33	2.13	1.93	1.67	1.30

STATION 8.

33	2.02	2.21	2.29	2.21	2.15	2.08	1.83	1.90	1.60	1.46	1.28
23	1.92	2.18	2.30	2.22	2.23	2.16	2.13	2.04	1.98	1.94	1.75
Means = 28.0	1.97	2.20	2.30	2.22	2.19	2.12	1.98	1.97	1.79	1.70	1.53

STATION 9.

48.0	3.20	3.38	3.36	3.15	3.14	3.02	2.80	2.86	2.78	2.42	2.27

STATION 11.

50	3.02	2.77	2.51	2.51	2.58	2.65	2.25	2.13	2.01	1.51	1.39

STATION 12.

59	3.20	3.67	3.77	3.67	3.61	3.54	3.45	3.31	3.21	2.77	2.58

STATION 13.

55	3.60	4.14	3.96	3.98	3.90	3.94	3.90	3.86	3.84	3.46	2.75
57	3.60	3.90	3.83	3.77	3 66	3.58	3.54	3.43	3.10	2.73	2.00
24	2.29	2.60	2.66	2.66	2.63	2.58	2.47	2.44	2.28	2.29	1.70
23	2.07	2.63	2.57	2 47	2.72	2.56	2.51	2.40	2.50	2.26	1.90
22	2.72	2.73	2.76	2.68	2.62	2.59	2.41	2.49	2.34	2.40	2.00
Means = 36.2	2.86	3.20	3.16	3.11	3.11	3.05	2.97	2.92	2.81	2.63	2.07

Velocities in feet per second at each tenth of depth, &c.—Continued.

STATION 14.

Depth.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
44	3.71	4.06	4.05	4.02	3.93	3.83	3.83	3.53	3.46	3.35	3.15
34	2.89	3.30	3.14	3.14	3.27	3.14	3.00	2 80	2.82	2.10	2.00
28	2.84	2.75	2.71	2.72	2.59	2.55	2.40	2.05	2.02	1.81	1.20
16	1.52	1.65	1.65	1.61	1.59	1.58	1.52	1.50	1.46	1.02	0.90
16	1.61	1.85	1.84	1.64	1.80	1.79	1.60	1.66	1.50	1.48	1.10
17	1.86	1.94	1.88	1.73	1.87	1.74	1 61	1.60	1.48	1.31	1.00
17	2.13	2.12	2.08	2.04	2.00	1.92	1 79	1.73	1.79	1.66	1.30
Means = 24.6	2.37	2.52	2.48	2.43	2.43	2.36	2.25	2.12	2.06	1.82	1.52

MEANS OF ALL OBSERVATIONS.

.....	2.65	2.88	2.87	2.81	2.80	2.70	2.59	2.50	2.35	2.15	1.74

ATCHAFALAYA SECTION.—STATION 5.

20	2.33	2.65	2.65	2.71	2.65	2.71	2.71	2 65	2.46	1.90	1.50
19	2.68	2.79	2.67	2 60	2 58	2.57	2.50	2.25	2.20	1.85	1.50
21	2.33	2.65	2.59	2.66	2.55	2.50	2.53	2.40	2.21	2.05	1.60
Means = 20 0	2.45	2.70	2.64	2.66	2.59	2.59	2.58	2.43	2.29	1.93	1.53

AREAS IN BRUNETTE BEND.

Date.	Gauge.	Width.	Area.	+Scour. −Fill.	Datum area.
1882.	*Feet.*	*Feet.*	*Sq. feet.*	*Sq. feet.*	*Sq. feet.*
May 30	61.6	2,728	230,918	.....	230,918
June 27	61.9	2,751	226,640	− 4,552	226,366
July 25	60.4	2,704	220,980	− 2,115	224,251
August 9	53.2	2,553	202,370	+ 315	224,566
September 29	36.0	2,407	147,738	− 11,976	212,590
October 31	32.9	2,354	.....	.....	.....

Means of velocities at each tenth of depth obtained from all the observations at the discharge sections in 1882, with number of observations and depth of mean velocity below the surface in parts of the whole depth.

Section.	Number of observations.	Depth of mean.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
Paducah	211	0.63	2.340	2.340	2.320	2.290	2.250	2.220	2.170	2.079	1.970	1.840	1.550
Columbus	101	0.71	2.665	3.077	3.178	3.205	3.227	3.204	3.126	2.988	2.818	2.519	2.136
Helena	90	0.61	5.157	5.145	5.042	4.916	4.812	4.709	4.493	4.288	3.982	3.577	2.999
Hays' Landing	620	0.60	3.466	3.475	3.458	3.439	3.405	3.332	3.249	3.161	3.034	2.890	*2.750
Red River Landing	32	0.61	2.650	2.880	2.870	2.810	2.800	2 700	2.590	2.500	2.350	2.150	1.740

* Interpolated.

MEAN OF ALL SECTIONS.

Depth of mean.	Surface.	.1	.2	.3	.4	.5	.6	.7	.8	.9	Bottom.
0.63	3.256	3.383	3.373	3.332	3.299	3.233	3.126	3.001	2.831	2.595	2.235

MEAN, EXCLUDING PADUCAH.

0.63	3.484	3.641	3.637	3.592	3.561	3.486	3.364	3.234	3.046	2.784	2.406

APPENDIX E.

REPORT OF CAPTAIN J. H. WILLARD, CORPS OF ENGINEERS, SECRETARY OF CONSTRUCTION COMMITTEE.

[The Mississippi River Commission, office of the Committee on Construction, 2653 Olive street, Saint Louis, Mo.]

SAINT LOUIS, MO., *October* 20, 1884.

SIR: In compliance with instructions from the president of the Commission, I have the honor to report the work of this office from November 1, 1883, the date of the last report, to September 30, 1884.

Captain Sears continued in charge until April 11, 1884, when he was transferred to the charge of the third district. By a resolution of the Commission November 20, 1883, his designation was changed from executive officer to secretary of the committee on construction; and in addition to the duties of that office he was made assistant to the committee as construction officer for plant, and was charged with the purchase of such material and supplies as district officers could not conveniently obtain for themselves, and with the consolidation and publication of monthly reports.

The floating and other public property for which he was responsible, not required for the general service, and the public funds held by him for purchases on account of the works of improvement were transferred to the district officers, and the responsibility was laid upon them for obtaining all supplies and material necessary for the proper conduct of their works either by direct purchase or through the purchasing officer by timely requisition, as they might find most advantageous and convenient.

When called upon for such service, this office fills requisitions by methods suited to the exigencies of the case and delivers the supplies in the most expeditious way, due regard being paid to economy of time and money. The accounts when audited are transmitted with certified bills and bills of lading, with or without the department vouchers, as may be desired, and the district officer checks the invoices and makes the payments. This method appears to give general satisfaction and is well adapted to the system of conducting the work. The accounts are simplified, and disbursing officers, having accurate knowledge at all times of the actual state of their allotments, can gauge their operations with greater freedom and economy.

As district officers are expected to and generally do supply themselves with stores and material for the works under their charge, purchases made through this office are usually on small orders or for supplies that the exigencies of the work require beyond what may be fairly estimated, or for which the district officers cannot provide storage.

The so-called contract system finds its limitations here, and if insisted upon will seriously impede the work of improvement and add largely to its cost.

Requisitions are filled by inviting proposals by circular letters when time will permit, by purchase in open market or by bargaining with the same care for the interests of the Government that a good business man adopts for the protection of his own. These methods are generally required by the exigencies of the service and are sanctioned by law.

The districts above Cairo were included in the general work under the Commission by the act approved July 5, 1884. Being more happily situated with respect to climate and obtaining with little difficulty labor, supplies, and stone for works conducted on a smaller scale than in the lower river, they do not require the assistance of this office and need not be considered in estimating for the general service.

The chief business of this office is now the management of the general service, consisting of steam tow-boats and barges, and the delivery of stone, wire, coal, and general supplies to the districts below Cairo.

Owing to the changes in the organization of the office which I have mentioned, separate statements are given of the expenditures under Captain Sears, as executive officer from November 1, 1883, to February 29, 1884, when the transfers were completed, and as secretary and assistant from March 1 to April 11, 1884, the date of his relief, and from April 12 to September 30, 1884, the period during which I have had charge. Under the present arrangement, the expenses of the general service are finally charged to the first, second, and third districts; those for plant, outfit, and repairs being divided equally, and the remainder, embracing administration, inspection, and running expenses of the steamboats, in proportion to the service rendered as computed from the mileage.

After the transfer of public property to the several districts, there were left for the general service, the inspection and tow-boat Mississippi, the tow-boat Minnetonka, bought April 10, 1884, after a thorough trial of three months under charter, fifty-six stone-barges, one store-boat, constructed out of an old hull, and one pumping-boat, the last two being kept at the coal-fleet at Cairo.

The plant has been kept in a high state of efficiency by prompt and liberal expenditures. The steamboats are in first-rate order, and are worth almost as much to the service as when first received.

The stone-barges are in fair condition, and are worth their cost to the Government; but from the nature of the service in which they are engaged, they would probably not fetch one-third of their first cost.

They have had hard usage in loading, in handling in rough water, and in long and unavoidable detentions at the works, both loaded and light. Constant attention has been required to keep them repaired, well calked, and seaworthy; and in addition to repairs made at docks and ship-yards, two men have been kept fully occupied at the fleet at Cairo, calking and repairing above light-water.

The plant at my disposal being inadequate to the needs of the districts, I made application for a large and powerful tow-boat for use on the Mississippi River for long trips, and for a small boat for service between the quarries and the fleet at Cairo. An urgent request was also made for increasing the number of stone-barges. The estimates received the approval of the Commission at its session, July 22, 1884, but owing to the comparatively small amount then available, the construction of the tow-boats was postponed; the increase of the barge-fleet was approved, however, and it was resolved to build thirty model barges at a cost not exceeding $150,000. Application was made to the Secretary of War for authority to buy or build under the resolution, and was approved August 16, 1884.

The appropriation for the Missouri River having become nearly exhausted early in the season, the plant required for that work was laid up at Bushberg. While on an inspection trip down the river, it occurred to me that it would be to the advantage of the Government to use the Missouri River stone-barges during the summer on the Mississippi improvement. After consultation with Major Suter, the officer of engineers in charge, authority was asked and obtained for temporary transfer of thirty barges to the general service, with permission to expend $2,400 in repairs.

By the wording of the act approved July 5, 1884, the Missouri River Commission cannot expend the new appropriation for that river until the plans shall have been approved by Congress, so that these barges are still at the disposal of the general service, and can be retained till navigation closes, or until called for, when they will be returned to the fleet at Bushberg, or will be cared for by the general service, as may be most convenient.

About $1,200 have been expended on them, and as they have been kept more than twice as long as was contemplated the amount for returning them in good order should be increased to $6,000.

The cost of chartering fifteen model barges equivalent in capacity to those borrowed would not have been less than $16,200 for the time they have been employed for the general service.

During the summer I inspected a great number of model barges, had lines and dimensions taken from those most approved, and collected specifications from well-known builders. After a study of the best models, I prepared specifications and had plans drawn which I submitted to experienced ship-builders for suggestions and improvement.

As the construction of new tow-boats was postponed, and the general service had the use of Missouri River barges, the necessity for the new barges was not so pressing; and as the amount of money required for the new barges was so great, and the necessity of having boats that will last for many years so plain, I thought it wise to delay construction until plans and specifications could be perfected. The drawings are now being revised on complete specifications, and it is thought that barges built according to the new designs will be the best wooden barges afloat in these waters. Under the circumstances, the delay in constructing them has been to the advantage of the Government; for had they been put in hand as soon as possible after authority was obtained, the greater number would have been finished only in time to cause expense for care during the winter. Time had also been given for comparing plans, and they can now be built without haste in season for work next spring.

The amount already allotted for their construction is considered ample.

The life of a wooden boat on the Mississippi is variously estimated at from six to nine years, the chief enemy being dry-rot. If an entirely new plant were to be constructed, I should recommend either iron or composite hulls as being the most economical in the long run.

But the amount already invested in plant, necessarily built in haste, because the work of improvement was imperatively demanded, is now so great that I do not feel justified in recommending those forms of construction except for steamboats. Should Congress, however, decide to set apart a large sum to be applied in allotments for a term of years for the improvement of the Mississippi, I think that there can be no question but that new plant should be constructed of iron, either wholly or in part, according to the service required.

I must now renew my earnest request for the two tow-boats, hulls to be of iron or composite construction.

Preliminary estimates have been made for them, and drawings projected; but construction should not be undertaken until plans and detailed estimates have been prepared.

For long trips, especially, a much more powerful boat than the Mississippi is reqnired; indeed, I recommend a larger boat than the Minnetonka; and, in making the preliminary estimate, I have taken her for a model, adding $12,000 for the increase in size and construction of hull, and $8,000 for larger boilers and heavier machinery.

The towing service is attended with great risks, and as the Government does not insure, the danger should be reduced to a minimum by using boats with surplus power. The boats now in service can take down stream from twelve to eighteen loaded barges; but they cannot tow economically more than from eight to twelve empty barges up stream against a strong current without carrying more steam than allowed on their inspection papers.

One of the obstacles to the delivery of stone has been the difficulty experienced in supplying quarries with empty barges. By the use of a small boat of good power and light draft, about the size of the Missouri River Commission tow-boat Stone, to collect loaded barges at the fleet and to distribnte empty barges to the quarries on both rivers, at least four days could be saved on nearly every trip of the large boats, and the service to the districts considerably increased and made much more regular.

The small boat could also take a fair sized tow of eight or ten loaded barges to the first district, and even to the second in an emergency, and could bring back five or six empty barges against an average current.

If built of iron, the large boat would cost about $60,000, and the small boat not much less than $30,000; the prices would be about 10 per cent. less, if built with composite hulls, and about 20 per cent. less if built with strong wooden hulls. On completion of the tow-boats, the Mississippi should be laid off as a spare boat for tours of inspection, temporary increase of the service, or to take the place of any of the others in case of accident, the crews being simply transferred. The costly and most unsatisfactory method of chartering would thus almost entirely be obviated. The Mississippi is naturally selected for reserve; she has not sufficient power to handle large tows in a strong current, not having been built solely for towing; and having an iron hull, she would not deteriorate while laid up.

In regard to the construction of new plant, I believe it would be to the best interests of the Government to follow the methods of business men and place the work on bids solicited only from builders of established reputation.

It is not only a question of construction, but of material. Wooden hulls should be entirely of the best oak, except decks and bulkheads; and as first class ship-timber has become very scarce, I think it safe to say that there are not more than half a dozen builders in the West who use or can control any considerable amount of the best upland oak. In a general competition, the lowest bidders are almost always parties with little capital, who have no facilities for building on a large scale, and who use the short-lived oak of lowland growth, which rots in two or three years. If iron or composite construction is adopted, the choice would be limited naturally to the few builders engaged in that kind of work.

With new tow-boats, new barges, and plant now on hand in good order, at least 20,000 cubic yards a month could be furnished regularly to the three districts below Cairo during active operations, large reserves being unloaded on the bank during spring high water.

The amount of stone furnished by the general service during the past year has been greater than in any year since the work was undertaken, but it has fallen short of requisitions from the districts, and the officers in charge have been somewhat embarrassed in their operations by uncertain and irregular delivery. That the progress of their work was not seriously delayed, was due in part to the fact that stone was delivered on the bank on early requisitions, but chiefly to long-continued high water, which prevented active operations till the season was well advanced.

Stone can be bought cheap only from quarries at least 50 miles above Cairo on the Mississippi or Ohio; if obtained from other sources, it must be transported to the river by rail at great expense for freight and handling.

All the stone furnished by the general service this season was bought in open market from a number of quarries on both rivers above Cairo, the greater part having been taken from the Southern Illinois Penitentiary at Chester.

It was of good quality and weight, and cost from 50 to 60 cents the cubic yard loaded on barges at the quarries, the price depending on the kind of stone furnished and the distance of the quarries from the river bank.

I have dealt generally directly with parties owning or controlling quarries, and the terms have been most favorable to the Government, hardly furnishing more than a bare living to the men who undertook the work.

In conducting the works of protection and improvement, it is of vital importance that the supply of stone shall be ample and sure, not only for securing work as it progresses, but for the economic organization of labor. The distances to which it must be transported vary from 200 to 1,200 miles, and the districts under improvement are of great extent, so that no work of bank protection, mattress construction, or dike-building can be undertaken with safety without a full supply of stone at hand, or the

certainty of its arriving within a given time. To insure this, the delivery of stone should be under the control of the general service provided with an adequate plant, and this work is quite enough to demand all the time and attention of one man, and should not be laid as an additional burden upon the district officers. The method of "open purchase" is the best and most economical for the Government at the present time, in my opinion, and I am positive that any attempt to contract for supply and delivery of stone to the works would result in disaster.

In reporting the amount of stone furnished by the general service, no account is taken of that delivered by rail at Arkansas City. Captain Sears made arrangements for that supply last season, and continued to draw from the same source after he had taken charge of the third district; about 6,000 cubic yards were on hand November 1, 1883, and 13,000 cubic yards were under contract for delivery.

The amount of stone delivered by the general service from November 1 to December 26, 1883, was 20,845 cubic yards; and from April 1 to September 30, 1884, was 75,364 cubic yards. The amount actually received from the quarries this season was 83,542 cubic yards, the average monthly output being almost 14,000 cubic yards. The average monthly delivery to the districts for the same period was 12,560 cubic yards. The average cost of delivery to the first, second, and third districts, including all expenses for steamboats, repairs, and charter, was very nearly 90 cents the cubic yard, making the average cost the cubic yard, delivered, $1.40 for sandstone, and $1.50 for limestone.

The cost of delivering stone to the fourth district for New Orleans Harbor, was not apportioned as for the other districts. The service was undertaken, somewhat to their disadvantage, to supply a pressing need. Special barges were chartered, and part of the running expenses of the boats was charged to that work for the extra time required, payment being made by the district officer.

The work of the year was by no means accomplished by the two general service tow-boats. The Minnetonka broke her shaft February 17, while taking a tow of empty barges up to the Mississippi quarries, and the Jack Frost was chartered for eight days to distribute the tow and bring her to Saint Louis for repairs. As the Minnetonka was under charter for trial at the time, the cost of repairs was borne by the owners. The Etheridge was utilized between Cairo and the quarries early in April, and was given a tow for the first and third districts on her way to the latter. Having met with an accident in May, she was sent to Saint Louis for repairs, and was used in the same manner on the return trip. While the Mississippi was engaged on a tour of inspection with the Commission, in May, the Minnetonka broke down, and the Jack Frost was chartered May 12 for eight days, and kept in service till June 6.

The Pearl, chartered in May for the first district, was taken for the general service in August for duty between Cairo and the quarries in low water. She will be kept at work till navigation closes, taking occasional tows to the first district, and may be retained in attendance on the fleet during the winter, being handier and more economical as a helper than either of the large boats.

The barge fleet also was increased at different times for special service. Between November 1, 1883, and February 29, 1884, twenty-one model barges were chartered and remained in service an average time of about eighty-two days each.

Six model barges were chartered in May for temporary use in carrying stone to the third district. In July, August, and September, sixteen model barges were chartered for special service in carrying stone to the fourth district for the improvement of New Orleans Harbor. Requisition was made in July for charter of ten model barges for use in the first district with the condition imposed that they should be without hog-chains. Very few good barges with clear decks were to be had, the market having been nearly exhausted to fill previous requisitions. Seven were obtained in July and August, and delivered loaded with stone.

Bids were invited in July for the construction of fifteen model barges, 170 by 38 by 6 feet, for the first district, but the prices ranged so much above the estimate, one bid being over $10,000, that it was not thought best to accept any. The subject was referred to the Commission which was then in session, and construction on the plans offered was not decided upon. Plans and specifications were prepared in this office in July for a special stern-wheel boat for use on Red River. The boat was finished and accepted in September and taken to Cairo, whence it will be sent with the next tow to the third district, and will steam from Wilson's Point to its destination.

Besides towing loaded and empty stone barges, the general service steamboats have taken from the several districts to the most convenient ship-yards and repair-shops, such of their plant as required overhauling, returning the same on the earliest trip after being put in order.

They have also distributed fuel purchased for the districts, and have been utilized as much as possible in carrying or towing supplies and stores bought on requisitions for them, at a considerable saving for transportation.

If the demands for such service were more regular, or for stated periods, prompt delivery could be arranged and a great reduction effected in the item of freights,

indeed, the proposed increase of the general service plant would enable me to deliver all supplies purchased for the districts.

The business has been conducted without serious accident or damage to the plant in tow, and, fortunately, without loss of life or injury to any of the crew. Minor accidents to the steamboats and annoying detentions have occurred, which interfered considerably with the delivery of stone and the return of empty barges. Barge 179, loaded with stone, was sunk at Grand Tower in May while waiting for a tow, and though several attempts have been made to raise it, they have been frustrated by sudden and unexpected rises of the river. The loss is not yet reported total, as another effort will be made, but if that fails it will be useless to try again.

On the night of May 22, barge 98, loaded with 14,600 bushels of coal, bought for the third district, was broken up and lost. The accident was due to a sudden squall during a storm, and was unavoidable. On the afternoon of June 3, boat 461, loaded with 24,379 bushels of coal, on the way to the third district, was sunk in Bullerton Chute by colliding with a barge loaded with stone. The wreck was buoyed, and as it lay out of the channel it was hoped that a portion of the cargo might be saved in low water, but the loss is total. Investigation satisfied me that the accident was unavoidable. June 17 a chartered model barge, loaded with stone, broke up and sank at Pilcher's Point.

The cause of the accident has not been reported to this office.

As the tow-boats have been kept running night and day with double crews, their boilers and furnaces have required considerable repairs. The Mississippi has given special trouble and expense for new fire-sheets, but the difficulty has been remedied by substituting a vertical heater and purifier for the pan heater, and taking out the center top flue from each boiler, there having been five ten-inch flues in each.

The Minnetonka has shown signs of weakness in the cylinder-timbers, and may have to be hauled out at the close of the season to be strengthened. I recommend reducing the weight of the upper works and the area of wind-resistance by transfering the galley, pantries, and deck-rooms to the space now taken up with spare cabins and staterooms, and increasing the strength of the hull by extra stanchions and bulkheads. Should new cylinder-timbers be required, I am inclined to recommend iron.

Without taking into account the care and handling of barges at the fleet or on the reaches, the general service tow-boats have moved between quarries and the districts during the navigable season covered by this report, 1,360 pieces, equivalent to towing one piece 318,436 miles, at a cost, including all expenses for steamboat service and repairs, of very nearly 25 cents the mile. In addition to towing service, the Mississippi has made about 2,400 miles on inspection duty with the Commission.

The question of providing fuel for general service and the districts is a very serious one, and I am not yet prepared to express a decided opinion upon it.

Captain Sears bought a large amount of Pittsburgh coal early in the season, delivered in boats and barges to the fleet at Cairo, on very reasonable terms. Pittsburgh coal is probably the best for steamboat use, but I doubt whether it is so much superior to the best Illinois coal as to balance the risks and expenses attendant upon its care at the fleet. As it comes down in large tows only when the Ohio is high, it must be bought in large quantities if we wish to get it cheap; and if it is essential that we should use Pittsburgh coal, it will be better to contract for delivery to the districts, or, if more economical to receive it in one lot at the fleet, to deliver it by the general service tow-boats as soon as possible after its arrival at Cairo. Nearly 40,000 bushels have been lost this season, and I find that there has been a considerable loss every year. I believe that an amount, equivalent to that lost and incurred for care at the fleet, could be turned to good account in the purchase of a few coal barges for supplying the districts with the best Illinois coal at a considerable saving in annual expense. At the average price paid for Pittsburgh coal this year, the estimate for supplying general service tow-boats for next season amounts to $61,600. I am almost positive that I could buy the necessary fuel of good quality, and build one coal barge for the general service, and six for the districts with this amount.

A good deal of annoyance has been experienced in the management of the floating property, from the loss of barge-pumps, and careful study has been given to remedy the difficulty. A design for a fixed bilge-pump has been made, and patterns are now in hand from which a few will be cast for experiment. It is proposed to put them below decks, or to box them in, and to have the handles secured by chains. For pumping barges that are leaking badly while in tow the steam-siphon is certainly very effective; but the waste of steam is immense, even when only one is used, and the necessity for applying it might arise in a dangerous part of the river, when the full power of the engines would be needed.

The difficulty of carrying a large siphon over barges loaded with stone, and of making connections to boilers with fixed lengths of pipe, should be seen to be appreciated.

It takes considerable time to prepare the apparatus for work, and if the joints give out after it has been running for any length of time, it is no easy matter to couple them while the pipes are hot. As an improvement on this cumbrous method of pumping I devised a plan, the basis of which was to be a powerful pump in the waist of each tow-boat, which I submitted to Major Suter, of the committee. Happily he had been working on the same lines, and had used water pressure for steam with good results. The design has been modified on his suggestions by substituting a force for a suction pump, and permanently fixing small water-jet siphons in the barges alongside each hand-pump. Strong rubber hose of small diameter, with snap couplings, and in lengths convenient for a man to carry, will be used for connections, the pump having as many branches on the discharge-pipe as may be required. In cold weather low steam can be sent through from the donkey boiler to start the jet, if necessary. I feel confident that the plan outlined above will solve the problem, but I shall try it in a small way with appliances now on hand before undertaking it on a large scale.

Five thousand dollars will be ample for the complete outfit of pumps for four tow-boats, two fixed siphons in each barge, spare siphons, and a full supply of hose.

In concluding my report, I think it proper to say that the management of the general service was made easy for me by the admirable organization of the business under Captain Sears, by the forbearance of the district officers, all of whom are my seniors in rank, and by the hearty co-operation of my office force. The officers of the boats and the overseers and inspectors are excellent men, and have been faithful and efficient in the performance of their duties under all circumstances.

I present herewith a directory of the Commission, with its officers and the districts under improvement in their order, statements under appropriate headings showing the financial and working operations of this office for the year, estimates for the general service for 1885, and the general financial statement of the appropriations for "improving Mississippi River" from July 1, 1882, to September 30, 1884.

THE MISSISSIPPI RIVER COMMISSION.

Col. and Bvt. Maj. Gen. QUINCY A. GILLMORE, Corps of Engineers, president, 33 West Houston street, New York.
Lieut. Col. and Bvt. Brig. Gen. CYRUS B. COMSTOCK, Corps of Engineers, 33 West Houston street, New York.
Maj. CHARLES R. SUTER, Corps of Engineers, 1415 Washington avenue, Saint Louis.
HENRY MITCHELL, civil engineer, United States Coast and Geodetic Survey, 9 Pemberton Square, Boston.
B. M. HARROD, civil engineer, Cotton Exchange building, New Orleans.
Hon. BOBERT S. TAYLOR, P. O. box 1648, Fort Wayne, Ind.
S. W. FERGUSON, civil engineer, Greenville, Miss.
First Lieut. SMITH S. LEACH, Corps of Engineers, secretary, 2828 Washington avenue, Saint Louis.

THE COMMITTEE ON CONSTRUCTION.

Messrs. COMSTOCK, GILLMORE, SUTER, and HARROD.
Capt. JOSEPH H. WILLARD, Corps of Engineers, secretary and assistant, 2653 Olive street, Saint Louis.

OFFICERS OF ENGINEERS IN CHARGE OF DISTRICTS.

Des Moines Rapids to Illinois River, 165 miles.

Capt. ERNEST H. RUFFNER, Quincy, Ill.

Illinois River to Ohio River, 245 miles.

Maj. OSWALD H. ERNST, custom-house, Saint Louis.

First district, Ohio River to foot of Island No. 40 (Plum Point Reach), 220 miles.

Capt. JOHN G. D. KNIGHT, custom-house, Cairo, Ill., and Elmot, Ark.

Second district, foot of Island No. 40 *to White River* (*Memphis Reach*), 180 *miles.*

Capt. CLINTON B. SEARS, Bethell Block, Memphis, Tenn.

Third district, White River to Warrenton, Miss. (*Lake Providence Reach*), 220 *miles.*

Captain SEARS, Memphis, Tenn., and Wilson's Point, La.

Fourth district, Warrenton to Head of Passes, 484 *miles.*

Maj. AMOS STICKNEY, 3 South Rampart street, New Orleans.

General service estimates for 1885.

One large tow-boat, iron hull	$60,000 00		
One small tow-boat, iron hull	30,000 00		
		$90,000 00	
General repairs to plant	12,000 00		
Extraordinary repairs to plant	8,000 00		
		20,000 00	
			$110,000 00
Running expenses:			
Steamer Mississippi, 5 months, at $3,600		18,000 00	
Steamer Minnetonka, 10 months, at $3,800		38,000 00	
New large tow-boat, 8 months, at $3,800		30,400 00	
New small tow-boat, 8 months, at $2,600		20,800 00	
			107,200 00
Fuel for general service steamboats:			
Mississippi, 150 days, at 600 bushels a day, 90,000 bushels.			
Minnetonka, 300 days, at 800 bushels a day, 240,000 bushels.			
New large, 240 days, at 800 bushels a day, 192,000 bushels.			
New small, 240 days, at 400 bushels a day, 96,000 bushels.			
618,000			
618,000 bushels, at 9 cents		55,620 00	
Cost of loading, 1 cent per bushel		6,180 00	
			61,800 00
Office salaries, rent, and contingencies		12,000 00	
Care of fleet and property		4,500 00	
Administration and inspection		4,500 00	
			21,000 00
Total			300,000 00

Estimated value of the general service plant, September 30, 1884.

Iron tow-boat Mississippi	$60,000
Wooden tow-boat Minnetonka	37,750
56 stone barges	84,000
1 pumping boat	1,300
1 store boat	950
Total	184,000

Statement of purchases made on requisition from districts.

First district:
Subsistence and general supplies, value about $34,000.
1,240,000 pounds of galvanized steel wire.
104,392 bushels of Pittsburgh coal.
Second district:
41,879 bushels of Pittsburgh coal.
Third district:
121,262 bushels of Pittsburgh coal.
210,000 pounds of galvanized steel wire.
Subsistence and general supplies, value about $22,000.
Fourth district:
Steam launch, $3,500.

Movement of stone.

Received from Mississippi quarries:			
November 1 to December 26, 1883 ..... cubic yards..	10,864		
April 1 to September 30, 1884 ..... do....	59,565		
		70,429	
Received from Ohio quarries:			
November 1 to December 26, 1883 ..... do....	9,981		
April 1 to September 30, 1884 ..... do....	23,977		
		33,958	
			104,387
Delivered to first district:			
November 1 to December 26, 1883 ..... do....	15,415		
April 1 to September 30, 1884 ..... do....	37,368		
		52,783	
Delivered to second district:			
November 1 to December 26, 1883 ..... do....	1,034		
April 1 to September 30, 1884 ..... do....	16,974		
		18,008	
Delivered to third district:			
November 1 to December 26, 1883 ..... do....	4,396		
April 1 to September 30, 1884 ..... do....	18,661		
		23,057	
Delivered to fourth district: In September, 1884 ..... do	.....	2,361	
			96,209
On the way to fourth district, September 30, 1884 ..... do....	.....	4,392	
Collected at the fleet at Cairo, September 30, 1884 ..... do....	.....	3,786	
			8,178
Total amount furnished, delivered, and on the way, November 1, 1883, to September 30, 1884	.....	.....	104,387

Expenditures by Capt. Clinton B. Sears, executive officer construction department, Mississippi River Commission, from November 1, 1883, to February 29, 1884, on account appropriation for improving Mississippi River, from allotments to the various reaches.

Character of expenditure.	New Madrid Reach.	Plum Point Reach.	Memphis Reach.	Lake Providence. Reach.	Improving harbor at New Orleans.	Total.
Administration and inspection ...	.....	$722 82	$240 82	$515 52	.....	$1,479 16
Care of public property	.....	210 59	114 97	154 04	$14 00	493 60
Fuel	.....	3,793 24	.....	2,256 40	.....	6,049 64
Office outfit	.....	.....	.....	7 50	.....	7 50
Material and supplies	.....	23,319 11	.....	28,107 19	3,279 75	54,706 05
Labor	.....	.....	.....	5,878 30	10 62	5,888 92
Plant and outfit	.....	280 31	31 03	296 11	42 50	649 95
Repairs to plant	.....	3,640 76	1,374 73	1,630 41	.....	6,645 90
Subsistence	.....	3,268 87	.....	2,852 14	.....	5,121 01
Transportation	.....	10,034 32	82 46	11.116 76	256 99	21,490 53
General service	$1,231 06	19,095 13	2,776 36	18,711 41	.....	41,813 96
Total	1,231 06	63,365 15	4,620 37	71,525 78	3,603 86	144,346 22

Expenditures by Capt. Clinton B. Sears, secretary committee on construction, Mississippi River Commission, on account appropriation for improving Mississippi River, from allotment for general service, from March 1, to April 11, 1884.

Office expenses	$819 56
Care of public property	645 03
Expenses steamer Mississippi	2,605 55
Expenses steamer Minnetonka	*41,025 50
Expenses steamer Etheridge	5,538 85
Expenses steamer Jack Frost	13 25
Towage and transportation	82 50
Administration and inspection	538 67
Total	51,268 91

* Includes $40,000 purchase money.

Expenditures by Capt. J. H. Willard, secretary committee on construction, Mississippi River Commission, on account appropriation for improving Mississippi River, from allotment for general service, from April 12 to September 30, 1884.

Office expenses	$4,789 53
Fuel	20,224 07
Coal fleet and care of public property	2,225 75
Steamer Mississippi	14,161 47
Steamer Minnetonka	14,546 35
Steamer Etheridge	1,193 39
Steamer Jack Frost	1,799 31
Steamer Pearl	2,858 40
Towage and transportation	1,565 68
Administration and inspection	1,906 58
Miscellaneous	3,836 25
Total	69,106 78

Classified summary of expenditures on account appropriation for improving Mississippi River, general service, from November 1, 1883, to September 30, 1884.

Services	$50,401 62
Plant and outfit	41,106 98
Fuel	31,856 01
Repairs to plant	13,001 06
Transportation and charter	9,560 63
Subsistence	8,753 00
Supplies and material	4,495 25
Mileage and traveling expenses	1,120 56
Rent and repairs	770 35
Telegrams	333 09
Stationery	205 94
Care of public property	184 80
Fuel for Capt. C. B. Sears	*121 65
Fuel and gas (office)	117 49
Water and ice (office)	83 05
Office furniture and outfit	78 17
Total	162,189 65

Expenditures under general service for plant and permanent outfit, apportioned equally between the first, second, and third districts, and operating expenses divided according to mileage service performed.

For New Madrid Reach	$1,231 06
For Plum Point Reach	60,120 63
For Memphis Reach	34,394 50
For Lake Providence Reach	66,443 46
Total	162,189 65

FINANCIAL STATEMENT.

November 1, 1883, to September 30, 1884.

GENERAL SERVICE.

	By Captain Sears.	By Captain Willard.	Total.
Drawn from Treasury	$75,000 00	$107,000 00	$182,000 00
Expended	42,232 07	78,143 62	120,375 69
Balance on hand September 30, 1884	†32,767 93	28,856 34	61,624 31

*A. R. 1851–'59.
†Transferred to Captain Willard April 11, 1884.

Apportionment of expenditures by general service March 1, 1884, *to September* 30, 1884.

Plum Point Reach	$41,025 50
Memphis Reach and Harbor	31,618 14
Lake Providence Reach	47,732 05
Total	120,375 69
Allotment third and fourth appropriations	392,000 00
Transferred from Plum Point and Lake Providence allotment $10,000 each	20,000 00
Total	412,000 00
Drawn	182,000 00
Balance in Treasury September 30, 1884	230,000 00
Balance in hand September 30, 1884	61,624 31
Available September 30, 1884	291,624 31
Allotted for construction of new plant	150,000 00
Estimated expenditures to December 31, 1884	31,594 43
Estimated balance December 31, 1884	110,029 88
Add deposit for sale of fuel	11 25
Estimated amount available for conducting general service January 1, 1885	110,041 13

PLUM POINT REACH.

	By Captains Sears and Willard.	By Captain Knight.	Total.
Balance on hand November 1, 1883	$25,365 15	$85,507 74	$110,872 89
Drawn from Treasury	79,025 50	593,500 00	672,525 50
Total to be accounted for	104,390 65	679,007 74	783,398 39
Expended	104,390 65	520,283 86	624,674 51
Balance on hand September 30, 1884		158,723 88	158,723 88

Balance in Treasury November 1, 1883		$51,000 00
Transferred from unallotted balance, second appropriation		77,000 00
Allotments from third and fourth appropriations		700,000 00
Proportion for general service		41,025 50
Total		869,025 50
Transferred to general service	$10,000 00	
Transferred to Atchafalaya Front	9,000 00	
Transferred to Tensas Front, fourth district	16,000 00	
		35,000 00
Amount available for the year		834,025 50
Drawn		672,525 50
Balance in Treasury September 30, 1884		161,500 00
Balance in hand		158,723 88
Available September 30, 1884		320,223 88
Estimated expenses to December 31, 1884		243,514 15
Balance		76,709 73
Deposit for loss of property		20 00
Estimated amount available for conducting work and care of property January 1, 1885		76,729 73

NEW MADRID REACH.

	By Captain Sears.	By Captain Knight.	Total.
Balance on hand November 1, 1883	$2,427 84	$1,001 05	$3,428 89
Expended	1,231 06	56 74	1,287 80
Balance available September 30, 1884	*1,196 78	944 31	2,141 09

* Transferred to Captain Knight March 31, 1884.

MEMPHIS REACH.

	By Captains Sears and Willard.	By Major Miller.	Total.
Balance on hand November 1, 1883	$4,620 36	$19,110 00	$23,730 36
Drawn from Treasury	31,618 14	98,000 00	129,618 14
Total to be accounted for	36,238 50	117,110 00	153,348 50
Expended	37,234 68	85,487 73	122,722 41
Balance on hand September 30, 1884	996 18	*31,622 27	30,626 09

* Transferred to Captain Sears.

Drawn from Treasury	$121,730 36
Drawn from Treasury for general service	31,618 14
Total to be accounted for	153,348 50
Expended	122,722 41
Balance in hand September 30, 1884	30,626 09
Balance in Treasury November 1, 1883	33,000 00
Allotments from third appropriation	90,000 00
Proportion for general service	31,618 14
Total	154,618 14
Drawn	129,618 14
Balance in Treasury September 30, 1884	25,000 00
Balance in hand September 30, 1884	30,626 09
Available September 30, 1884	55,626 09
Estimated expenditures to December 31, 1884	30,626 09
Estimated amount available for conducting work and care of property to January 1, 1885	25,000 00

MEMPHIS HARBOR.

	By Major Miller.	By Captain Sears.	Total.
Drawn from Treasury	$40,000 00	$130,000 00	$170,000 00
Expended	28,102 74	42,685 39	70,788 13
Balance in hand September 30, 1884	*11,897 26	87,314 61	99,211 87

* Transferred to Captain Sears.

Allotment from fourth appropriation	$200,000 00
Drawn from Treasury	170,000 00
Balance in Treasury	30,000 00
Balance in hands of disbursing officer	99,211 87
Available September 30, 1884	129,211 87
Estimated expenses to December 31, 1884	129.211 87

SURVEY OF HELENA REACH.

Balance available November 1, 1883	$488 71
Expended	488 71
Available September 30, 1884	000 00

LEVEE AT LONG LAKE.

Drawn from Treasury	$1,000 00
Expended	15 55
Balance in hand	984 45
Allotment from fourth appropriation	15,000 00
Drawn	1,000 00
Balance in Treasury	14,000 00
Balance in hand	984 45
Available September 30, 1884	14,984 45
Estimated expenses to December 31, 1884	14,984 45

OPOSSUM FORK LEVEE.

Allotment, $25,000, none of which has been drawn or expended.
Estimated expenditures to December 31, 1884 ..... $25,000 00

VICKSBURG HARBOR.

	By Captain Sears.	By Captain Marshall.	Total.
Balance on hand November 1, 1883	.....	$5,477 60	$5,477 60
Drawn	$25,000 00	5,585 58	30,585 58
Total to be accounted for	25,000 00	11,063 18	36,063 18
Expended	17,571 51	7,770 98	25,342 49
Balance available September 30, 1884	7,428 49	*3,292 20	10,720 69

* Transferred to Captain Sears.

Available November 1, 1883		$55,477 60
Allotment from fourth appropriation		25,000 00
Total		80,477 60
Transferred to Lake Providence	$42,295 00	
Transferred to Delta Point	2,119 42	
		44,414 42
Balance		36,063 18
Expended		25,342 49
Available September 30, 1884		10,720 69
Estimated expenses to December 31, 1884		10,720 69

LAKE PROVIDENCE REACH.

	By Captains Sears and Willard.	By Captain Marshall.	Total.
Balance on hand November 1, 1883	$4,700 78	$14,627 15	$19,327 93
Drawn from Treasury	512,557 05	224,670 00	737,227 05
Total to be accounted for	517,257 83	239,297 15	756,554 98
Expended	505,539 40	187,552 16	693,092 56
Balance in hand September 30, 1884	11,718 43	*51,744 99	63,463 42

* Transferred to Captain Sears.

Balance in Treasury November 1, 1883		$137,000 00
Transferred from unallotted balance of second appropriation		67,200 00
Transferred from allotment for Vicksburg Harbor		42,295 00
Allotted from third and fourth appropriations		700,000 00
Proportion for general service		47,732 05
Total		994,227 05
Transferred to general service	$10,000 00	
Transferred to Tensas Front, third district	10,000 00	
Transferred to Yazoo Front, third district	10,000 00	
Transferred to Atchafalaya Front, fourth district	27,000 00	
		57,000 00
Balance		937,227 05
Drawn from Treasury		737,227 05
Balance in Treasury		200,000 00
Balance in hand		63,463 42
Available September 30, 1884		263,463 42
Add deposit for sale of fuel		29 25
Estimated expenses to December 31, 1884		338,492 67
Estimated balance available for work and care of property January 1, 1885		25,000 00

NEW ORLEANS HARBOR.

	By Captain Sears.	By Major Stickney.	Total.
Balance in hand November 1, 1883	$8,430 11	$5,577 10	$2,853 01
Drawn from Treasury	8,000 00	90,000 00	98,000 00
Total to be accounted for	16,430 11	84,422 90	100,853 01
Expended	3,603 86	60,371 98	63,975 84
Balance in hand September 30, 1884	*12,826 25	24,050 92	36,879 17

* Transferred to Captain Sears.

Balance in Treasury November 1, 1883		$106,525 90
Drawn from Treasury		98,000 00
Balance in Treasury		8,525 90
Balance in hand		36,877 17
Available September 30, 1884		45,403 07
Estimated expenses to December 31, 1884		45,403 07

SAINT FRANCIS FRONT, FIRST DISTRICT.

Available November 1, 1883	$1,687 09
Expended	1,560 20
Balance available September 30, 1884	126 89

SAINT FRANCIS FRONT, SECOND DISTRICT.

Available November 1, 1883	$787 07
Expended	787 07
Balance available September 30, 1884	000 00

MOUTH OF RED RIVER.

	By Captain Sears.	By Major Stickney.	Total.
Balance in hand November 1, 1883	$571 26	$14,729 52	$14,158 26
Drawn from Treasury	.....	61,000 00	61,000 00
Total to be accounted for	571 26	46,270 48	46,841 74
Expended	.....	28,632 32	28,632 32
Balance in hand September 30, 1884	*571 26	17,638 16	18,209 42

* Transferred to Captain Sears.

Balance in Treasury November 1, 1883	$53,000 00
Allotment from fourth appropriation	12,290 00
Total	65,290 00
Drawn	61,000 00
Balance in Treasury	4,290 00
Balance in hand	18,209 42
Available September 30, 1884	22,499 42
Estimated expenses to December 31, 1884	17,499 42
Estimated amount available for carrying on work and care of property January 1, 1885	5,000 00

NATCHEZ AND VIDALIA.

Available November 1, 1884	$5,331 42
Expended by Major Stickney	2,658 50
Balance available September 30, 1884	2,672 92
Estimated expenses to December 31, 1884	1,672 92
Estimated amount available for conducting work and care of property January 1, 1885	1,000 00

OBSERVATIONS AT CARROLLTON.

The observations are being carried on with an allotment from the appropriation for the Mississippi River Commission.

SURVEY OF UNLEVEED FRONTS IN THE THIRD DISTRICT.

Available November 1, 1883	$503 04
Expended by Captain Marshall	502 53
Balance available September 30, 1884	0 51

SURVEY OF UNLEVEED FRONTS IN THE FOURTH DISTRICT.

Drawn by Major Stickney	$1,000 00
Expended by Major Stickney	902 12
Balance available September 30, 1884	97 88
Estimated expenses to December 31, 1884	97 88

SURVEY OF CUBITT'S GAP.

Available November 1, 1883	$162 86
Expended	000 00
Balance available September 30, 1884	162 86

DELTA POINT, LOUISIANA.

Available November 1, 1883	$7 64
Transferred from Vicksburg Harbor	2,119 42
Total	2,127 06
Expended	2,127 06
Balance September 30, 1884	000 00

CHOCTAW BEND SURVEY.

Available November 1, 1883	$1,320 14
Expended	000 00
Balance available September 30, 1884	1,320 14

This survey has been completed.

CUT-OFF AT TARPLEY.

Allotment from third appropriation	$3,000 00
Transferred to Yazoo Front, third district	3,000 00
Available September 30, 1884	000 00

LEVEES, SECOND DISTRICT.

Yazoo Front.

Balance available November 1, 1883	$1,117 75
Expended by Major Miller	1,117 75
Available September 30, 1884	000 00

All this allotment has been drawn.

THIRD DISTRICT.

Tensas Front.

	By Captain Sears.	By Captain Marshall.	Total.
Balance in hand November 1, 1883	.....	$37,683 51	$37,683 51
Drawn	$25,000 00	40,000 00	65,000 00
Total to be accounted for	25,000 00	77,683 51	102,683 51
Expended	7,258 04	63,239 00	70,497 04
Balance in hand September 30, 1884	17,741 96	*14,444 51	32,186 47

* Transferred to Captain Sears.

Balance in Treasury November 1, 1883	$20,000 00
Allotted from third appropriation	10,000 00
Transferred from Lake Providence	10,000 00
Allotted from fourth appropriation	50,000 00
Total	90,000 00
Drawn from Treasury	65,000 00
Balance in Treasury	25,000 00
Balance in hand	32,186 47
Available September 30, 1884	57,186 47
Estimated expenses to December 31, 1884	57,186 47

YAZOO FRONT.

	By Captain Sears.	By Captain Marshall.	Total.
Balance on hand November 1, 1883		$20,213 68	$20,213 68
Drawn	$23,000 00		23,000 00
Total to be accounted for	23,000 00	20,213 68	43,213 68
Expended	7,449 12	22,170 31	29,619 43
Balance in hand September 30, 1884	15,550 88	*1,956 63	13,594 25

*Transferred to Captain Sears.

Transferred from Lake Providence	$10,000 00
Transferred from cut-off at Tarpley	3,000 00
Allotment from fourth appropriation	20,000 00
Total	33,000 00
Drawn	23,000 00
Balance in Treasury	10,000 00
Balance in hand	13,594 25
Available September 30, 1884	23,594 25
Estimated expenses to December 31, 1884	23,594 25

FOURTH DISTRICT.

Atchafalaya Front.

Available November 1, 1883	$7,052 78
Drawn	24,000 00
Total	31,052 78
Expended	23,961 18
Balance on hand	7,091 60
Transferred from Plum Point	9,000 00
Transferred from Lake Providence	27,000 00
Total	36,000 00
Drawn	24,000 00
Balance in Treasury	12,000 00
Balance in hand	7,091 60
Available September 30, 1884	19,091 60
Estimated expenses to December 31, 1884	19,091 60

Tensas Front.

Available November 1, 1883	$174,529 19
Drawn	21,000 00
Total	195,529 19
Expended	192,555 81
Balance in Treasury	2,973 38
Allotted from third appropriation	5,000 00
Transferred from Plum Point	16,000 00
Allotted from fourth appropriation	90,000 00
Total	111,000 00
Drawn	21,000 00
Balance in Treasury	90,000 00
Balance in hand	2,973 38

Available September 30, 1884	$92,973 38
Estimated expenses to December 31, 1884	92,973 38
Total balance in hand November 1, 1883 (levees)	230,596 91
Drawn	144,000 00
Total	374,596 91
Expended	317,766 76
Balance in hand	56,830 15
Balance in Treasury November 1, 1883	30,000 00
Transferred from Plum Point	25,000 00
Transferred from Lake Providence	47,000 00
Transferred from Tarpley Cut-off	3,000 00
Allotted from third appropriation	15,000 00
Allotted from fourth appropriation	200,000 00
Total	320,000 00
Drawn	144,000 00
Balance in Treasury	176,000 00
Balance in hand	56,830 15
Available September 30, 1884	232,830 15
Estimated expenses to December 31, 1884	232,830 15

DES MOINES RAPIDS TO ILLINOIS RIVER.

Balance from former appropriations July 1, 1884	$12,663 38
Allotment, act approved July 5, 1884	200,000 00
Total	212,663 38
Expended	30,914 73
Balance September 30, 1884	181,748 65
Estimated expenses to December 31, 1884	71,748 65
Estimated balance for work and care of property to January 1, 1885	110,000 00

ILLINOIS RIVER TO OHIO RIVER.

Balance from former appropriations July 1, 1884	$5,354 51
Allotment, act approved July 5, 1884	470,000 00
Total	475,354 51
Expended	87,882 14
Balance September 30, 1884	387,471 37
Estimated expenses to December 31, 1884	147,472 37
Estimated balance for work and care of property January 1, 1885	147,472 37

PROTECTION OF EASTERLY BANK OF MISSISSIPPI, NEAR CAIRO.

Allotment, act approved July 5, 1884	$50,000 00
Expended	5.511 51
Balance September 30, 1884	44.488 49
Estimated expenses to December 31, 1884	18,488 49
Estimated balance for work and care of property to January 1, 1884	26,000 00

Respectfully submitted.

J. H. WILLARD,
Captain of Engineers,
Secretary Committee on Construction, Mississippi River Commission.

First Lieut. SMITH S. LEACH,
Corps of Engineers, Secretary Mississippi River Commission,
2823 Washington Avenue, Saint Louis, Mo.

APPENDIX F.

REPORT OF CAPTAIN J. G. D. KNIGHT, CORPS OF ENGINEERS, UPON OPERATIONS IN THE FIRST DISTRICT.

UNITED STATES ENGINEER OFFICE,
Cairo, Ill., October 25, 1884.

SIR: I submit the following report of operations in the 1st district, Mississippi River, between November 1, 1883, and October 1, 1884.

SAINT FRANCIS FRONT.

There has been platted the location of the line of levees along so much of this front as lies in this district. In addition an alternate line has been run a distance of 8.75 miles from Mill Bayou to the vicinity of Barfield, which avoids caving banks, is not too remote from the river, and substitutes the closing of a small slough for that of Mill Bayou, thus leaving the latter free for the floating out of timber, a business whose prosecution, if interrupted, would endanger the levee.

STATEMENT.

Allotment		$5,000 00
Expended November 1, 1883	$3,312 91	
Expended November 1, 1883, to October 1, 1884	1,560 20	
		4,873 11
Balance on hand October 1, 1884		126 89

NEW MADRID REACH.

February 4, 1884, a preliminary project for the improvement of 33.5 miles of this reach was submitted, involving the expenditure of $179,675 for plant and $1,453,000 for construction work. With the experience gained in the Plum Point Reach, it is thought that the estimated cost of construction should be increased. Moreover, with the many changes continuing on this reach, so much of the project as related to dike work should now be modified, and that relating to bank protection extended. Caving in the vicinity of Darnell's continues with great rapidity, and a water-spout has so gullied the front of New Madrid as to render it less able than ever to withstand the cutting action of the river. This season, however, navigation through the reach has been attended with much less difficulty than last.

STATEMENT.

Allotment, less retransfers to other allotments		$212,500 00
Expended November 1, 1883	$209,071 11	
Expended November 1, 1883, to October 1, 1884	1,287 80	
		210,358 91
Balance October 1, 1884		2,141 09

PLUM POINT REACH.

Though this reach, as defined by the Commission, is 40 miles long, work of improvement has been limited to that portion of the reach bounded up-stream by Gold Dust Landing and down-stream by Yankee Bar, a distance of 13 miles. Within these limits seven different construction parties have been at work, and the reports of the various chiefs are attached. Brief reference will now be made to each of the localities occupied by these parties, taking them in their down-stream order.

Gold Dust dikes.—The condition of this work, November 1, 1883, is set forth in the report of the Mississippi River Commission, 1883 (page 365, and plate 37). Its present condition is shown in Plate IX. As at present projected, it is thought this work will be completed before the coming high water. Damage to the main dike and cross-dikes was done as described in the reports of Assistant Engineers Firth and Gender (Appendixes F 1, and F 3). Heavy fills have occurred immediately behind the main and cross dikes, which at some places are 30 feet above low-water level; the curve of low water closes below No. 5, a deposit of 12 feet having taken place since October, 1883. The openings unavoidably left in upper dike to give access to lower unfinished ones, served at high water to give admission to heavy drift, and, on a falling river, to develop heavy scour through Elmot Chute; the drift was detrimental to unfinished work. The main dike has been reinforced by a row of piling in its front. No attempts have been made to close Dikes 4 and 5, and that to close 3 was abandoned. To continue it would have been to risk failure to close all openings above it; while its closure was not deemed essential to the turning from Elmot Chute of the flow of

the river in its lower stages. The report of Assistant Engineer George W. Gender fully describes the operations since last report, and is of interest as showing how difficulties, which might well have discouraged, were intelligently met and overcome. Attention is invited to the maps of Assistant Engineer Craig, showing condition of river in vicinity of Gold Dust October, 1884 (Plate VI), and comparisons of this with its condition October, 1883 (Plate V).

Fletcher's Field Revetment (*Plate* X).—This is to extend eventually from Mill Bayou down to near the head of Upper Osceola Chute; 493 running feet of mattress, 175 feet wide, is in place, and 800 feet of narrower mattress; the object of the latter, narrower mattress, having been to check disastrous caving promptly; 2,000 feet of high-water protection is partially laden with stone, and there is a reasonable prospect that at all points where work has been commenced, the end of the season will find the work completed in its details as far as it extends. The continuity of this work is interrupted by a heavily interlaced mass of fallen timber. As far as the power of the boat would admit, this was removed by the snag-boat John R. Meigs, temporarily placed at my disposal by Maj. A. M. Miller, Corps of Engineers, U. S. A.; for the heavier mass, it is hoped, and by the engineer officer in charge of the Mississippi River snag-boats deemed probable, that the services of one of the heaviest snag-boats could be secured to remove so much of the rack-heap as was too heavy for the Meigs. Besides this, trouble arises, as at Bullerton Tow-head, from seepage. The maximum caving in this bend between October, 1883, and May, 1884, occurred at range 33½, and amounted to 700 feet.

Osceola Upper and Lower bars.—On pages 366–369, Report of Mississippi River Commission, 1883, is shown the condition November 1, 1883, of the dikes and bank protection near these bars. Since then Dikes 1 and 2 have needed little attention. The mass of drift in front of No. 1 was consolidated by the rise of the river and increased; the first deposit near the dike, not rising with the water, the rest floating over and lodging upon it, and more in front of it. The low-water shore-line now comes in front of the line of the dike, as shown in the sketch of Assistant Engineer W. L. Seddon (Plate XII). Behind the dike the chute is dry at a 10-foot stage, and for two-thirds of its width filled nearly to the height of the adjacent tow-head, and covered with a growth of young willows. Dike No. 3 has been closed, and repairs made at the ends where the river tended to flank it. Thirty acres of drift are now accumulated above it. No revetment work has been done on the upper bar. By December 26, 1883, 2,663 linear feet of mattress, about 150 feet wide, had been sunk in front of the lower bar. The supply of material did not render practicable the resumption of work here until last August, when it was found necessary to add at the head a mattress 1,337 feet long, to connect the earlier mattress with the shore. The bank above all mattress work is now graded to a slope of 1 on from 2½ to 3½, and 972 linear feet are revetted with brush. It is not doubted that Assistant Engineer Seddon will have the revetment work well up with the mattress work by the end of the season. His report for this section of the reach is attached (F. 4).

Osceola No. 4 —This dike has been approximately located near the foot of Osceola Chute, but a survey in the spring of this year indicating a tendency of the river to cut across the foot of Osceola Chute and thence into Bullerton Chute, I changed the location to just below the foot of Osceola Bar, parallel to and 100 feet above range 48½. Its length is 2,450 feet. The construction of the Arkansas end of this dike was rendered difficult by the river's taking the expected turn. Caving commenced at the bank and heavy scour set in across the dike location, giving a depth of water of 50 feet, which, however, was somewhat avoided by an offset in the dike. Large accumulations of drift have occurred above the Arkansas end of the dike during the recent rise; during August and September a fill between the rows of the dike of from 5 to 20 feet has taken place, and one of 15 feet 100 feet behind the dike. No scour nor tendency to the same has been discovered.

The report of Superintendent James M. Riley, hereto attached (Appendix F 5 and Plate XI), gives a clear, concise statement of difficulties encountered and largely by his persistent energy overcome.

Bullerton Tow-head.—At date of last report in this vicinity the revetment of the tow-head required for its completion 500 feet of mattress, 2,700 of revetment, and much distribution of stone. It has since been completed, but repeated repairs have been and still are necessary. I estimate that at the present time 750 feet need repairs which in extent will amount to renewing the revetment or high-water protection. These repairs can not be considered general, for the general condition of the work is good; but are confined mainly to general localities where their need recurs, and where seepage prevails. The total protection is 8,700 feet long; the repairs therein made during June and July, 1884, required 1,391 linear feet of mattress, 45 to 50 feet wide, 1,105 linear feet of revetment and 1,004 of grading. In July it was found to be possible to undertake Bullerton Dike No. 2, which I definitely located at the Sans Souci section of the chute. Later work was started on the closure of No. 1, of necessity left unfinished, last year's only practicable low-water channel being down the chute.

The change of direction required by deep water in No. 1 last season being no longer needed, it will be completed on the line of direction of the tow-head portion. Openings through both Nos. 1 and 2 were necessary to access to Osceola No. 4, but orders have been given to leave drivers at No. 4 with a supply of material and close No. 1. At a higher stage these drivers can be gotten out; the season is too nearly at an end to allow of any delay in the completion of the lower cross-dikes. The sites of both of these have been mattressed their entire length; the lower dike will have a tipped mattress; the upper will not.

Superintendent A. J. Nolty's report (Appendix F 6), together with his sketch (Plate XIV), shows condition and location of work, which he has administered with energy and economy.

Plum Point Dikes.—The plate (Plate XIII) attached sufficiently indicates their location and present extent. At the close of last season 3,445 feet of dike had been built. October 1 this had been increased to 15,010 feet. In accordance with project amended by the Commission, cross-dike No. 3 has yet to be extended 100 feet; No. 4, 400 feet; and No. 5, 500 feet. Whether it will be necessary after these extensions to further extend the entire system remains to be seen. The channel-way remaining varies from 4,000 feet in width at the foot of Bullerton Tow-head to 4,800 feet at the head. Still, no extension not already projected should be more than considered until the work in Bullerton Chute, at the foot of Lower Osceola Bar, and the repairs of Bullerton Tow-head revetment are completed. The dikes so far built have served to close one channel to the left of Bullerton Bar, and will, it is hoped, tend to check the wearing away of the head of Yankee Bar.

For details of construction and statement of work accomplished, reference may be had to the report of Assistant Engineer S. P. Hatfield (Appendix F 7), whose charge of the work has been well administered.

Craighead Point Revetment.—While during previous seasons the necessity of ultimately revetting Craighead Point from Bullerton Tow-head down-stream was admitted, no immediate urgency existed. But this season the bar in front of the Lower Osceola Bar, moving down-stream, partially closed the entrance to the channel immediately along the front of Bullerton Tow-head, and the water passing mainly around the head of Yankee Bar and through Bullerton Bar united to cause rapid caving, both by direct assaults and by indirect, the latter arising from the bar formation where these two currents met, passing close to the Arkansas shore. Operations were carried on during August and September, but were attended with success in August only. Difficulties encountered during September, arising from current and drift, were not successfully overcome. The location of work done is shown in the sketch attached (Plate XV), and the disasters attending the starting of new mattresses and struggles with drift are set forth in the report of Assistant Engineer F. A. Yeager. (Appendix F 8.)

Results.—These are set forth in the report of Assistant Engineer N. B. Craig, who has had charge of surveys, and has energetically carried them on despite much sickness of himself and party. Attached to this report are—Plates I and II—a map of reach as surveyed May–June, 1884 (2 sheets); III, areas of effective low-water cross-sections, October, 1881–October, 1883, and May, 1884; and scour and deposit between October, 1881, and October, 1883; Plate VII, condition of river in vicinity of Bullerton Tow-head, low water of 1884; IV, comparison of this with condition October, 1883; VI, condition of river in vicinity of Gold Dust dikes, low water of 1884; V, comparison of this with condition October, 1883. The second shows an increase of effective area of low water between October, 1881, and October. 1883, from Gold Dust to Elmot, a marked increase at head of Bullerton Chute, and a decided decrease along Bullerton Tow-head, the decrease continuing to Craighead Point. The comparisons with May, 1884, are comparisons of low-water stages of 1881 and 1883, with a stage of 1884, intermediate between high and low, of interest as showing an increase in area of cross-section along the front of Osceola Lower Bar during a high stage. Mr. Craig's report also describes in general terms the changes in vicinity of Bullerton Bar, and gives data of importance concerning locations and extent of caving banks on this reach, notably a caving of 400 feet on Tennessee shore, 750 feet below range 25 between October, 1883, and April, 1884; a caving of 700 feet between October, 1883, and May, 1884, on Arkansas end of range 33½; a recession down-stream between the same dates of the head of Yankee Bar, amounting to 740 feet, and a caving of 380 feet at Arkansas end of range 63½ between October, 1883, and June, 1884. Four maps (Plates VI and VII), relating to Gold Dust and Bullerton, prepared by him, give completely the changes between the low waters of 1883 and 1884, which have occurred in the immediate vicinity of dike works.

Of the discharge observations that of September 15, 1884, shows a discharge through Bullerton Chute of 23.7 per cent.; through the Tennessee Channel, 18.3 per cent.; through the Bullerton Bar, or middle channel, 31.3 per cent., and along outside of Bullerton Tow-head, 26.7 per cent. In other words, at this low water three-fourths of the river passed outside of Bullerton Chute; last low-water season only one-half passed outside. September 15, 1884, the area of Bullerton Chute discharge section was two-

sevenths of the sum of the sections of the four channels. During August and the earlier part of September Bullerton Bar re-established its claim to being an impediment to navigation. It was on record as having been such prior to improvement work commencing on this reach; but, since this commencement, had never so shown itself until this summer. About 8½ feet could be carried through for the time in question, but the channel was narrow and tortuous, scarcely deserving the name. Steamboats lightened, and in broad daylight went aground. This state of affairs confirms me in the belief that the satisfactory depth over Bullerton Bar during previous seasons should not be attributed to works then going on. Not without interest is a comparison of the reduced channel depths over Bullerton Bar, shown on Assistant Craig's outline map of May–June, 1884 (Plate II), and the depths as shown on his map of same vicinity at low water of 1884.

The low-water survey of next season and of 1886 may be expected to indicate whether or no advance is being made in securing a satisfactory low-water channel along the front of Bullerton Tow-head. This season all that can be claimed for the dikes is that they assisted in removing obstacles to low-water navigation two or three weeks earlier than nature, unaided, removed them elsewhere in the river. Next season, I believe, they will materially aid in preventing their recurrence.

The details of cost to date of work so far performed at the various stations are given in the following table.

In the case of Bullerton Tow-head Revetment the cost of completed work, per linear foot of bank, is given; but the cost of completed protection and dike-work cannot yet be given in case of the other works yet incomplete.

Estimated cost of works of construction near Plum Point, Tenn., to October 1, 1884.

Work.	Labor on construction.	Material for construction.	Subsistence.	Repair, costs, and outfit of plant.	Care of property.	Towage and steamers.
Ashport Bank Revetment	$5,149 72	$5,041 46	$2,852 27	$8,120 51	$1,091 71	$4,422 22
Gold Dust Dikes	110,018 59	107,703 56	60,934 65	173,483 94	23,429 13	94,474 92
Fletcher's Field Revetment	16,385 48	16,041 01	9,075 42	25,837 97	3,473 66	14,070 70
Osceola:						
Upper dike	9,035 44	8,845 48	5,004 43	14,247 80	1,863 40	7,759 00
Middle dike	9,129 06	8,937 14	5,056 29	14,395 45	1,882 14	7,839 40
Cross dike	31,366 49	30,707 08	17,372 92	49,461 26	6,649 56	26,935 35
Upper Bar Revetment	5,009 27	4,903 97	2,774 48	7,899 04	1,061 96	4,301 60
Lower Bar Revetment	16,385 48	16,041 01	9,075 42	25,837 97	3,473 67	14,070 70
Bullerton:						
Main dike	17,321 80	16,957 64	9,594 02	27,314 43	3,672 17	14,874 74
Cross dike No. 1	14,044 70	13,749 44	7,778 92	22,146 83	2,977 43	12,060 60
Cross dike No. 2	11,001 68	10,770 40	6,093 48	17,348 36	2,332 31	9,447 47
Tow-head Revetment	42,836 34	41,935 79	23,725 71	67,547 83	9,081 27	36,784 83
Plum Point Dikes	62,733 02	61,414 20	34,745 82	98,922 55	13,299 28	53,870 68
Craighead Point Revetment	5,383 80	5,270 62	2,981 92	8,489 62	1,141 34	4,623 23
Totals	355,800 87	348,318 80	197,065 75	861,053 56	75,429 03	305,535 44

Work.	General administration of office.	Survey.	Miscellaneous.	Total cost.	Work covered by contracts.	Approximate cost.
					Linear feet.	
Ashport Bank Revetment	$553 01	$372 30	$237 74	$27,840 94	2,694	$10 34
Gold Dust Dikes	11,814 46	7,954 06	5,078 75	594,892 06	38,974	*15 26
Fletcher's Field Revetment	1,759 58	1,184 56	756 46	88,584 84	6,150	14 40
Osceola:						
Upper dike	970 30	653 22	417 14	48,796 21	7,315	†6 67
Middle dike	980 00	659 98	421 47	49,300 93	3,773	†13 07
Cross dike	3,368 34	2,267 59	1,448 09	169,576 68	9,437	17 97
Upper Bar Revetment	537 93	362 13	231 26	27,081 64	3,160	8 74
Lower Bar Revetment	1,759 58	1,184 56	756 46	88,584 85	4,300	20 60
Bullerton:						
Main dike	1,860 13	1,252 25	799 69	93,646 87	8,305	11 28
Cross dike No. 1	1,508 23	1,015 34	648 40	75,929 89	1,800	42 18
Cross dike No. 2	1,181 33	795 35	507 91	59,478 29	1,400	42 48
Tow-head Revetment	4,600 05	3,096 78	1,977 62	231,586 22	8,700	‡26 62
Plum Point Dikes	6,736 67	4,534 23	2,896 16	339,152 61	15,010	22 60
Craighead Point Revetment	578 16	389 22	248 54	29,106 45	1,050	27 72
Totals	38,207 77	25,721 57	16,425 69	1,923,558 48		

*$1.40 repairs. † Complete; balance incomplete. ‡ $1.67 repairs.

Estimated value of plant, first district, Mississippi River.

Craft.	No.	Original cost.	Craft.	No.	Estimated value on September 30, 1884.
Pile-drivers	37	$183,715 00	Pile-drivers	37	$131,667 00
Quarter-boats	16	58,320 00	Quarter-boats*	16	29,349 00
Mattress-boats	8	43,310 00	Mattress-boats	8	21,968 00
			Do †	2	10,828 00
Graders	2	60,464 00	Graders	2	42,978 00
Derrick-boats	2	9,900 00	Derrick-boats	2	6,586 00
Barges	53	118,145 00	Barges ‡	51	54,832 00
Machine-boat	1	8,200 00	Machine-boat	1	5,773 00
Whitehall boats	6	339 00	Whitehall boats	6	221 00
Skiffs	63	1,416 50	Skiffs	63	1,210 00
Launch Mineola	1	3,200 00	Launch Mineola §		
Launch Titania	1	1,500 00	Launch Titania	1	1,229 00
Steamer Itasca	1	9,500 00	Steamer Itasca	1	9,266 00
Steamer P. Kirns	1	11,740 00	Steamer P. Kirns	1	8,913 00
Total		509,749 50	Total		324,820 00

* One of the quarter-boats entirely unfit for use; $29,349 represents value of 15 quarter-boats.
† Two mattress-boats received during the period covered by present report.
‡ Two barges sunk.
§ Sunk.

The launch and barges sunk were a total loss. The quarter-boat, no longer safe afloat, has been floated out on the bank at high water, and now serves as a workshop.

The number of barges available has proved insufficient. Efforts to charter additional ones have not been attended with much success. For next season's use more barges must be built. Some if not all of these should be iron, as I see no reason why they could not be used and thereby effect a considerable saving in the annual expense of repair of barges.

At least one more steamboat will be needed for long towage of brush and poles.

Details of construction of pile dikes are set forth in the report of A. J. Frith, assistant engineer in local charge (Appendix F 1). The attention and study given by him to these has resulted in a form of construction which will probably need no further modifications. With mattress laid in advance of dike construction, and in chutes, along the entire dike location, before the dike proper is commenced, pile work can certainly be prosecuted in 30 feet of water. But in swift currents the upper matwork, as tipped mattresses or wattling, should not follow pile work until the latter is very near completion. In case of closing chutes or of a system of dikes, especial study should be given to the order in which work is to be done. Access to work in process of construction should be unrestricted by other work, either in like stage or already completed. The closing of openings left through some work to reach other is likely to be expensive and slow. Longitudinal dikes, furnishing a boundary to the projected channel, should not be constructed until all cross dikes in rear are built out to their full extent. Earlier construction of these tends to prevent useful deposits of drift over areas where fill is hoped for, and access to cross dikes which may need repairs before the results expected from them have been realized. Tipped mattresses should be placed in the down-stream dikes of a system; those intended to catch drift do not need them. Their use on intermediate dikes is of doubtful utility. Revetting ends of dikes in chutes is advisable; revetting shore ends of spur dikes which are run out from convex points is of course not necessary.

Though fill is proportional to height of dike, it is not recommended therefore to raise the top of the dike above a mean stage, but to take this advantage, viz, in locations where the construction of a dike is advisable, and where depth of water does not prevent it, prosecute this construction during high-water stages, keeping tops of dikes to lowest elevations necessitated by high water and reducing the heights as the river falls, until the tops are on a level with the mean river stage. Below this the top line should not go.

It is advisable that cypress piling should replace cottonwood to a greater extent; the difficulty in the way is that contracts for cypress piling are better made at the close of a working season than at the beginning. Cypress brakes in this district are at a considerable distance from the river, requiring at low water a haul too long to be considered, while at high water the piling can be floated out to the edge of the banks ready for rafting as required. But this otherwise timely season is generally very untimely for the reason that funds are then almost exhausted, and it is not known whether another appropriation will be passed by Congress or when it may be ex-

pected. Hardly a proper condition of affairs with which to enter upon a contract for a delivery of material.

Protection work has not yet proved an entire success. While in depths of from 50 to 70 feet it seems probable that a bank can be held against assaults from the water side, the method of protecting a bank from the influence of seepage water has not yet been devised. Trouble with drifts may be obviated by the use of fender barges to slant the drift from the head and flank of a mattress. Care should be taken that the close of the working season finds all mattress work accompanied by corresponding completed upper bank protection; otherwise it will probably be necessary the following season to construct another interior mattress.

The question of timely supplies of material is still troublesome, though less so than in former seasons. But with a large increase of force engaged in protection work, to obtain the requisite supplies of brush and poles will be no easy matter. At high water the willow camps are overflowed. At intermediate falling stages they are quagmires, and at low water many of them are inaccessible to barges and steamboats. The importance of this subject may be seen when it is known that during the period covered by this report there have been used on this reach 32,591 cords of brush and 3,729 cords of poles.

All work has been done by hired labor. In purchasing brush, piles, and poles, written sealed proposals have been obtained in response to circular letters to principal dealers. The prices paid for these articles are, piles, 3¾ cents per running foot delivered at the works; brush and poles delivered on barges at $1.07 and $2 per cord respectively. Fresh beef has been supplied under contract at 7 cents per pound. A large amount of wire was contracted for by the purchasing agent of the Commission, and proposals have recently been received, after advertisement, and accepted, for supplying grocers' supplies, canned fruits and vegetables, salt meats, and millers' supplies. One contractor, C. Mark Cole, having failed in his delivery of piling, moneys due him at the time of failure were, as per agreement, forfeited to the United States.

Work to be done in accordance with existing projects and between Ashport and Craighead Point is approximately as follows:

	Feet.
Ashport to Gold Dust Revetment	18,000
Mill Bayou to head of Osceola Revetment	18,500
Upper Osceola Bar Revetment	3,000
Lower Osceola Bar Revetment	5,500
Upper side of Craighead Point Revetment	14,000
Total	59,000
Gold Dust Dikes	1,400
Osceola No. 4 Dikes	300
Plum Point Dikes	1,000
Bullerton Nos. 1 and 2 Dikes	1,000
Total	3,700
In addition it may be thought advisable to revet head of Yankee Bar	2,000
Revet head of tow-head to the west of islands	400
Total	2,400
And to construct spur dike near foot of Elmot Chute	1,500
2 spur dikes at Plum Point	1,200
Total	2,700
Projected work:	
59,000 feet of revetment work, at $25	$1,475,000
3,700 feet of dike work, at $25	92,500
Suggested work:	
2,400 feet of revetment work, at $25	60,000
2,700 feet of dike work, at $22	59,400
Total estimated cost	1,686,900

It is thought that this construction work will continue to increase in cost; the difficulty of getting material continually increases, and with this the cost. Moreover, methods of revetting banks influenced by seepage will be more expensive than the ordinary bank protection.

STATEMENT.

Allotments from appropriation of—	
March 3, 1881	$568,095 18
August 2, 1882	1,077,000 00
January 19, 1884	365,000 00
July 5, 1884	300,000 00
Collected from employés for lost property and deposited in United States Treasury	20 00
Proportion of allotments for general service charged to Plum Point Reach	41,025 50
Total	2,351,140 68
Expended to date	2,030,896 80
Balance	320,243 88

Of this balance $130,723.88 are drawn from the Treasury, $28,000 are in transitu, and $85,000 applied for, for use in November, 1884. Hence, $76,520 is the estimated balance December 1, 1884, for prosecuting work and caring for plant until another appropriation is made.

General matters relating to the first district.—On the Plum Point Reach a study of places requiring attention develops many where the need of protection is urgent, and so on with the district itself. Excessive caving characterizes the vicinity of Hickman, Columbus, New Madrid Bend, and the bend of Island 35, and considering its possible effect on the first district, I trust I may be allowed to invite attention to the bend opposite and below Cairo. Should systematic bank protection, progressing down-stream from some determined origin, be undertaken, that origin should be placed above Cairo on the Mississippi. But such progressive work will be slow, and in the mean time it would be well to undertake, simultaneously, such as will tend to improve the river where caving is progressing with exceedingly injurious rapidity.

Of these points, it certainly needs no defense to select, other things being equal, those where damage being done to property is greatest. Such a selection would arrange the points above named in the following order: Bird's Point, New Madrid Front (not Bend), Island 35 bend, Darnell's (New Madrid Bend), Columbus, and Hickman.

The following table gives the total expenditure on the first district, and also includes $26,636.68 liabilities incurred.

Statement of money disbursed, first district, Mississippi River.

	Plum Point.	New Madrid.	Saint Francis Front.
General administration	$117,458 74	$683 98	
Office	20,749 03	21 00	
Care of property	75,429 03	18 50	
Construction of plant	476,361 46	193,549 99	
Steamers, towage, &c	324,943 44	7,296 30	
Subsistence	197,065 75		
Survey	25,721 57	4,555 69	$4,873 11
Labor on plant	161,696 68	20 00	
Labor on construction works	355,800 87		
Material for construction works	348,318 80		
Quarters	37,562 22		
Miscellaneous	16,425 69	4,213 25	
To date	2,057,533 48	210,358 91	4,873 11

Expended as per report, 1883	$1,573,057 25	Plum Point	$2,057,533 48
Expended since	699,708 25	New Madrid	210,358 91
		Saint Francis	4,873 11
	2,272,765 50		2,272,765 50

Very respectfully,

JOHN G. D. KNIGHT,
Captain of Engineers, U. S. A.

Lieut. Col. C. B. COMSTOCK,
Corps of Engineers, U. S. A.,
President Mississippi River Commission.

F 1.

REPORT OF ARTHUR J. FRITH, ASSISTANT ENGINEER, UPON THE IMPROVEMENT OF THE MISSISSIPPI RIVER AT PLUM POINT.

UNITED STATES ENGINEER OFFICE,
Elmot, Ark., October 1, 1884.

CAPTAIN; I have the honor to make a report on the improvement of the Mississippi River at Plum Point, Tenn., covering the period between November 1, 1883, and October 1, 1884.

By reference to map (I and II) accompanying Assistant Craig's report it will be seen that the work on this reach may be divided into five distinct stations or points of operation, the objecct of which is to concentrate the bulk of water within a single channel.

1. The closing of the chutes between Elmot Bar and the Tennessee shore by the main and cross dikes at and below Gold Dust.

2. The protection of the Arkansas shore from Fletcher's Landing to Elmot against the continual encroachment of the river.

3. The closing of the chutes between the Arkansas shore and Osceola Bars and Bullerton Tow-head and the protection of the river banks of the latter island.

4. The encroachment of the Tennessee shore upon the river bed by main and cross dikes below Plum Point.

5. The protection of the Arkansas shore below Bullerton Tow-head against further caving.

On November 1, 1883, and previous to the high water, the condition of these several scenes of operations were as follows:

At Gold Dust there was a main dike running from Gold Dust to Elmot Bar and seven cross-dikes between it and the Tennessee shore, namely: Cross-dike No. 1, No. 1 A, No. 1 B, No. 2, No. 3, No. 4, and No. 5. The portions of these dikes lying upon the continuation of Elmot Bar were of the earlier type of construction and are deemed weak.

Those nearer the channel portion are in accord once with later specifications and of much better construction.

There was a continuous line of openings through the main and cross dikes, following the line of deepest water.

This channel had been imperatively necessary for the supply of material to the various localities where work was in progress, and as this is essentially a high-water chute, that is, its greatest current and discharge being during the higher stages of water, it was earnestly desired that all our work should be in a condition to withstand the attack of the coming season. Lack of material furnished, due greatly to the inclemency of the weather, rendered futile the attainment of this object. The opening in Cross-dike No. 5 was closed and mattressed, but that in No. 4 was only partially finished, and the other openings were all clear and wide. On the main dike and bar end of Cross-dike —, foot and tipped mattresses were finished, but were weighted in many instances by sand-bags in place of rock. At Station 2 the protection of Fletcher's Bend had not been commenced. At Station 3, Osceola Cross-dike No. 1, between Upper Osceola Bar and the Arkansas shore, was complete with heavy drift piled in front and some fell behind it. This, as well as Osceola No. 2, further down the chute, was thoroughly inspected and braced with wire cables during the end of the season.

Osceola Cross-dike No. 3, between Lower Osceola Bar and the Arkansas shore, was finished and mattressed. The inner shore of the bar was mattressed and the outer shore for 3,583 feet was protected by mattress 150 feet wide, of which the latter portion was sunk just previous to the final rising of the river.

In Bullerton Chute the closing was but partial, since the steamboat channel ran through it, and the final work could not be done until a passage was found elsewhere.

At this point there was the main dike between Osceola Bar and Bullerton Tow-head and Bullerton Cross-dike No. 1, which, with the exception of the opening for steamboats, was completed and mattressed. Bullerton Tow-head was mattressed throughout its entire length, and we were able to finish and load the entire high-water protection before the final rising of the river.

At Station No. 4, Cross-dikes Nos. 1 and 2 and the main dike to the latter were driven with an opening just above No. 1. Of this, No. 1 and the main dike above it were finished with foot and tipped mat, but No. 2 and the lower end of main dike were unmattressed.

At Station No. 5 no efforts had as yet been made to protect the Arkansas shore.

During November the river rose from 9 to 18 feet, and fell again to 7 feet on December 25, when, accompanied with ice, the winter rise set in. This first rise was sudden and pressed us closely. Its first effect was to increase the current in Elmot Chute, Station No. 1, to a dangerous extent, especially at Cross-dike No. 5, where the channel

is narrow, and to cause large accumulations on the main and cross dikes. At No. 5 the head of the water was beyond all expectations, being estimated to be from 14 to 18 inches, and at the main dike much less, probably not over 5 or 6 inches. No. 5 dike stood this enormous pressure of over 2 tons to the running foot in the deepest portion for some time. Then the forward brace gave way, and the front line fell back on the second. It remained thus for a time, but with violent shaking of the individual piles and clusters, when it finally broke in several places. No. 4 was also damaged, but all other portions were uninjured. Efforts were made to repair the damage, but rising water and ice soon put a stop to all operations.

At Station No. 3 the effect on Osceola No. 1 was most interesting; at the first rise one-half of the accumulation of drift 600 feet wide in front of the dike apparently narrowed and then filled out again, caused by the drift next to the piling being buried and anchored; so thus on the water rising, the accumulation behind rose and floated over it. There was no current behind this dike.

At Osceola No. 3 a vast amount of drift lodged against the dike, pressing it back in the center, where we were driven out at low water before completing it; for a time this threatened a total destruction, but timely efforts soon strengthened this portion, and no damage was sustained.

Bullerton main dike and Cross-dike No. 1 also showed accumulatiens of drift, but no harm was done.

At Station No. 4, the only effect of this rise was to show a noticeable fill behind the dike of from 5 to 10 feet, but the high water and floating ice put a stop to field operations and forced us into winter quarters.

The crest of the rise was reached at this point February 27, 1884, when the guage showed 32.05 foot above low water of 1879.

As much of the Gold Dust, Bullerton, and Plum Point dikes reach but to the height of the 15-foot stage, they were, of course, covered at the higher stage of the river. Osceola Nos. 1, 2, and 3, and parts of Bullerton No. 1 and Plum Point dikes, approached the high-water level and held large amounts of drift. We closely watched for the different effects that might be ascribed to this difference of height, and found that the height of fill was in almost direct ratio to the height of the dike.

Slack water prevailed behind the artificial rafts of drift at Osceola Nos. 1 and 3 and in Bullerton Chute, the latter due to the chute being a low-water chute, where alone a heavy current is induced by resistances in front of Bullerton Tow-head at low water.

Our experience in the early winter had warned us that improvement in our standard of dikes would be advisable in three particulars:

1. That with deep water and excessive width of dike it would be advisable to use more than three rows of piling, for where the distance apart of the pile rows was greater than 25 feet the braces were greatly weakened by their own weight.

2. That the former fastenings by drift-bolts and wire were exceedingly uncertain, the drift-bolts splitting the piles, and the wire wrappings being often loose and of unequal tension, when a dike was subject to great shaking of the piles, as at No. 5, Gold Dust. This might cause failure even under moderate pressures.

It has therefore been our practice during the past season to use no drift-bolts, and to bind every intersection of dike with short cables, 15 to 20 feet long, made of 16 strands of No. 12 wire or its equivalent. These are drawn tight with a winch, securely lashed, and renders these joints by far the strongest portion of the dike.

3. The tipped mattress is made upon piles slung within the dike and either hung from the center row with two cables running to top of front pile or lashed to center piles, and with cables to front row. This lessens the danger of breaking of the supports of mattress, brings the strain upon the dike in a manner deemed most beneficial, and free motion is allowed the lower end to follow any scour that may occur. Fig. 1, Plate VIII, is a plan, elevation, and section of this dike, showing how the width, number of rows, and number of piles in clusters vary with varying depths, also difference in bracing and tipped mattress in shallow and deep water. As the water fell, trouble was experienced with the revetment on Bullerton Tow-head, on which portions would slide down, carrying brush and stone with it. This was due mostly to seepage from lakes in the interior, the drainage of which afforded but partial relief. This action threatens to be a very serious one, and experiments have been in progress during the summer, details of which may be found in Assistant Nolty's report, with the object of draining the banks. Our results, however, do not promise much, unless the impervious clay layer existing in nearly all banks along which the water flows, and from which the seepage caving commences, unless the layer is above low water, when drainage, such as Fig. 2, will probably be effective. When the layer is below low water two different methods are in progress of trial:

First (Fig. 3), aheavy mattress or retaining wall is built and sunk at the foot of the bank and heavily loaded with stone.

Second (Fig. 4), clusters of piles are driven 5 feet apart along the bank, which pierce to the hard strata below; inside of this fascines of brush and drift are piled till the space is filled.

Both of these methods aim to allow the water to pass through, while the material is held back and a resistance offered to the sliding of the bank.

It is not deemed necessary to prepare the entire bend in this manner, but only those spots where this action has taken place, it being believed that there exist lines of subdrainage along which the bank waters will always flow, and hence that the points of attack are located and determined by pockets, previous actions and dipping of the strata.

Upon the subsidence of the high water it was seen that our work had not only suffered very little, but that heavy fills were formed behind all our dikes. At Gold Dust, behind the higher portions of the main dike, the fill, varying from 12 to 15 feet, reached the top of the piling, and parts of the cross-dikes were buried On the lower portion nearer the chute channel the dike was clogged with drift, and the fill, though continuous, was not so high. Recent surveys show that the curves of low water this year have drawn together, giving a total fall in this chute of 3,000,000 cubic yards.

The action of the tipped mattress showed very markedly that their lower edge follows quickly any scour at that point, while the eddying behind is much reduced.

During high water there was one break of about 400 feet in the main dike, caused by a local obstruction which destroyed some of the fill in the higher part of the bar, and many piles along the front row of the main dike had been broken by drift, which had here done considerable damage.

At Station No. 3 the fill behind Osceola No. 1 reaches to the top of the dike, and leaves but a small chute next to the Arkansas shore, which is closed at about the 12-foot stage.

All except this little chute is now covered with a thick growth of small willows, and the chute may be considered permanently closed

At Osceola No. 3 a vast accumulation of drift lies before the dike, and fills, varying from 10 to 25 feet, have taken place behind it, and a general fill of 6 to 8 feet in front, the mattress on the inside of the bar being buried and the upper bar tailed down to the dike. This chute is now dry at about the 12-foot stage of the river.

The mattress on the front of Osceola Bar, though without shore protection, stood well, but a small portion of the head of the island having caved away, makes a sub-mattress necessary before the revetment can be finished.

Bullerton main and cross-dikes No. 1 had large fill back of th m, that behind the latter now bearing a crop of low willow. Thus the former channel of the river would have been closed at low water had not the current later in the season broken through just at the foot of Osceola Bar, rendering the construction of Osceola Cross-dike No. 4 necessary.

These will, however, be mentioned later on. The fill behind the Plum Point system of dikes, as far as constructed, was as high as 25 feet, except at the opening in the main dike, where it was only small. The height of the deposit was almost in direct ratio to the height of the dike, while the tipped mattress at low water lay on the fall of the deposit as a revetment, and is growing in many places. When the water had fallen sufficiently work was commenced on the repairs and to finish the Gold Dust system of dikes (Station 1).

This consisted in driving a new dike in the 400-foot break in the main dike, and in running another row of piling on the face of the dike for 4,475 feet, where it had been injured by drift, and in weighting with stone portions of old tipped mattress formerly sunk with sand-bags, which had proven most inefficient.

When attempts were made to close the openings in the main and cross dikes it was evident that in the lower dikes the depth had so increased during the winter that work was nigh impossible, and our efforts had been confined to the closing and mattressing of Cross-dikes Nos. 2, 1 B, 1 A, 1, and the main dike.

The current was very severe at this point, and at your suggestion mattressing preceded the pile work. This was accomplished by driving clusters, from 15 to 20 feet apart, some distance above the dike from which the mattress is built, either continuously or in sections of 100 feet or more down-stream, with cables running to the foot of the clusters (Fig. 5). This method has proved very successful, and has been used on most of our channel dikes this season.

At this date all main and cross dikes, Nos. 1 and 1*a* openings, are closed, and the work will undoubtedly be finished by the end of the season. At Station 2, Fletcher's Bend had caved badly during the winter, and the falling trees had left a mass of snags in some places 100 feet wide, and matted into a jagged mass that, until removed, rendered mattress work impossible. The snag-boat John R. Meigs was borrowed from the Memphis Reach, and from the 19th of May to 17th of July she did good work, but was finally obliged to abandon quite a stretch of bank, not being powerful enough to handle the snags encountered. We have therefore left this portion, but have constructed above it 3,181 feet of mattress 175 feet wide, requiring .59 cords of brush and .56 cubic yards of stone to the 100 square feet, and below 1,750 feet with banks graded. We trust to have all finished before high water.

At Station No. 2 no work was necessary on Osceola Dikes Nos. 1, 2, and 3, and late in the section 1,337 feet of mattress was constructed on Lower Osceola Bar to connect the old mattress thoroughly with the banks graded; all this will be brushed and loaded this season. At the foot of this bar it has been mentioned that after the first fall in the river the water broke through the upper portion of the old main dike, and was cutting a channel through the deposit at the foot of the bar. To counteract this tendency Osceola Dike No. 4 was commenced May 12, 1884, and runs from the main dike to the Arkansas shore just above range 48½. Except near the Arkansas shore most of this dike is driven on the bar and has been matressed. From a portion of it we were driven out by a falling river, and must wait for the fall rise to finish it. In the channel near the Arkansas shore the water was rapid and deep, 50 feet in one place, and this portion of the dike was driven under considerable disadvantage with five rows of piling; since then it has collected a large amount of drift. The current has materially slackened, and a deposit of from 15 to 20 feet has been found during low water. In Bullerton Chute the completion of Cross-dike No. 1 and the construction of No. 2 will be finished before the close of the season. With both these dikes mattressing preceded the pile work, which varies from 3 to 4 rows, according to the depth. No. 2 will be tipped-mattressed its entire length.

At Station No. 4, Plum Point system of dikes, work was started early in the spring before the water had fallen, and has been in progress throughout the season.

Cross-dikes Nos. 2, 3, 4, 5, and 6, and part of the main dike, have been finished, all of which, except No. 6, will be tipped-mattressed, and are of the strongest dimensions. Their effect has already been beneficial, turning the water out of the Yankee Bar Chute. They have undoubtedly contributed materially to the maintenance of a steamboat channel during the low-water season.

The work done at this point has amounted to 12,057 feet of pile dike, 470,425 square feet of foot mattress (grillage), and 255,730 square feet of tipped mattress. The conditions for maintaining good steamboat water at Bullerton this season have been most unfavorable, the water being divided between a channel around Osceola Bar and through Osceola Cross-dike No. 4 and through Bullerton main dike and chute, one crossing to the head of Bullerton and along the outside shore, one by a channel through an extension of Yankee Bar, and by another channel along the face of Yankee Bar. The first and last of these were obstructed by Osceola No. 4 and Plumb Point dikes, while the steamboat water changed from crossing over to head of Bullerton to the fourth or bar channel, and then back again, giving at present plenty of water and a straight passage. Station No. 5, or the protection of Craighead Point, was not commenced until somewhat late, when the cutting away through the bar in front of Yankee Bar impinged the current directly against the bank.

One section of mattress 150 feet wide has been placed at this point, but a second section, though built extra strong, broke 14 lines—1½ and 2 inches diameter—and tore itself loose. The current at this point being very swift another section of mattress, with grading and protection of bank, yet remains to be built. I may add that the supply of piles and brush, though not always in quantities as large as might have been desired, has been much better than in years previous, and the establishment of the rick depot at Gold Dust has been of very material aid.

The working plant in use consisted of 37 pile-drivers, 15 quarter-boats, 10 mattress-boats, 2 graders, 2 derrick-boats, and 53 barges.

Details of the operations at different stations will be found in the reports of the several assistants, to whose energy and devotion to their work most of our success is due.

Respectfully submitted by

ARTHUR J. FRITH,
United States Assistant Engineer.

Capt. JOHN G. D. KNIGHT,
Corps of Engineers, U. S. A.

F 2.

REPORT OF GEORGE W. GENDER, ASSISTANT ENGINEER, UPON OPERATIONS OF GOLD DUST, TENNESSEE.

GOLD DUST, TENN., *October* 1, 1884.

SIR: I have the honor to submit the following report on the progress of the work at Gold Dust from November 1, 1883, to October 1, 1884 (Appendix F 3 and Plate IX):

A history of this work to November 1, 1883, was given in my last report.

Its location is shown upon accompanying sketch (Plate IX). Work at this locality

was in progress continuously from November 1, 1883, until the season was closed by the high stage of the river; resumed June 17, and continued to the time of this writing. It is thought that the Gold Dust dikes will be completed before the coming high water can interfere with construction.

Advantage was taken of the low water of 1883, and the pile work of the main dike pushed vigorously, completing the dike, with the exception of an opening of 300 feet in length, which had to be left to enable the boats to reach the parties at work on the lower cross dikes, before November 1, 1883.

The foot-mat party, with the available plant, was unable to keep up to the pile work, and the high water arrived before the foot-mat in front of the dike could be completed.

The grillage mat between the piling was placed for the entire length of the dike. The following mats were constructed before operations had to be suspended on account of high water. The 100-foot tipped foot-mat was continued for 305 linear feet. It was found by inspection after the high water went down that the pressure was too great for the supports of this mat, and either broke the riders of the dike or the piles by which the down-stream edge of the mat was held at the level of the riders of the dike. The tipped grillage of which 1,884.1 squares were constructed, had the same weakness. Where tipped grillage or foot-mat remained in their original position, they were a decided success, causing large deposits to form immediately under them.

Matting previously commenced was completed to top of piles for 700 linear feet = 82.7 squares. It was deemed advisable to place a foot-mat, 50 feet wide, directly in front of the main dike, between Cross-dikes Nos. 3 and 4, to prevent any parallel scour, and 775 linear feet, equal to 387.5 squares, were placed, when high water prevented further operations. A portion of this mat was constructed on the dry bar, and where it was possible the mat was wired to the tipped grillage. Later events proved the wisdom of this step; for during the high water a scour parallel to the dike took place deep enough to wash out some of the piles at the lower end of the dike, when the foot mat could not be completed. At the Tennessee end of the main dike 68.8 squares of bank protection were constructed and loaded with rock. During the high stage of the river piles were driven through the bank protection and the main dike extended toward the Tennessee shore for 100 feet.

This portion of the dike running up on high ground it was deemed sufficient to build it of a single line of piles.

The dike has had the desired effect of causing heavy deposits immediately in the rear of it, and but little damage was done to it by the protracted high water.

After the high water went down, one breach of 400 feet was discovered just below Cross-dike No. 3. The damage by this portion giving way was entirely local. The current after passing through the opening soon lost its force, and beyond scouring out a deep hole immediately behind the dike, did no harm.

At this gap the difference of slope on the chute side, and the main river was so great, caused by Cross-dike No. 3 just above it, and obstructions in front of the main dike just below the gap, as to render the current extremely rapid through this portion of the main dike, resulting in scouring under the mat deep enough to wash out the piles. A similar scour has taken place below Cross-dike No. 4; and to guard against like injury, the protecting mat of the main dike will have to be built especially thick and wide, and well loaded with rock for some distance below each cross-dike. The pile work of the main dike should be strongest at a cross-dike, and decrease in strength to the next cross-dike below. Where the dike was high it was damaged more or less by heavy masses of drift resting on riders and braces, and crushing these by their weight after the water had fallen. That portion of the dike driven to a 15-foot stage remained almost intact.

The bar which formed immediately behind the main dike, between Cross-dikes Nos. 3 and 4, is almost as high as the dike for the entire distance. The crest of the bar is 30 feet above the level of the low water of 1879. From Cross-dike No. 3 to the opening left for passing material the fill gradually decreases and is nothing at the down-stream end of the opening. At the Tennessee end of the main dike the material has been deposited as high as the main shore, and a level bar almost as high as the dike extends to the up-stream end of the opening. During the higher stages of the river a fill took place below the opening, but the river falling below a 15-foot stage, almost all the water passing down Elmot chute rushed through this opening with great rapidity, scouring to a depth of 20 feet before it could be protected by a foot-mat.

The crest of the bar in front of the main dike within the space allotted to the channel was lowered from 10 to 12 feet during high water.

On June 17, after the high water had passed, pile drivers resumed operations, and immediately commenced closing the breach in the main dike, below Cross-dike No. 3. They barely succeeded in closing the second and third rows, when it became necessary to withdraw them from the opening, the water shoaling so rapidly. Pile-drivers then commenced repairing the damaged riders and braces of the high portion of the main dike. It having been discovered that the front row of this portion

of the dike, where it had not been protected by a foot-mat directly in front of it, had been almost washed out by the scour parallel to the dike, it was deemed advisable to drive a new front row with piles spaced 5 feet between clusters, this spacing being employed to prevent, if possible, the breaking down of riders and braces by the heavy drift. After completing 4,475 linear feet, the pile-drivers were transferred to the cross-dikes.

On August 1, the foot-mat party returned to Gold Dust, and commenced the construction of a foot-mat in the opening of the main dike left for passing material, which was scouring rapidly. The current was very swift, and to be able to sink the mat successfully every precaution had to be taken in its construction. While being constructed the mat was held in place by wire cables fastened to clusters, which were driven on a line about 75 feet above the line of the dike. The clusters were driven 20 feet apart, and consisted of three piles, each pile having a cable fastened to it at the bottom of the river. To prevent the swaying and working out of clusters the piles of each cluster were driven some distance apart, drawn together at the top, and finally lashed with No. 8 wire. The mattress boat was placed at right angles to the line of the clusters and the cables fastened to the mat while it was being fabricated. Four men were able to fasten these well, as fast as the mat was constructed. In the swift current the cables leading to the bottom of clusters would have a tendency to pull the mat under water as soon as it was launched from the mattress-boat; to prevent this wire cables were fastened to the top of clusters and kept short enough to prevent a strain on the lower cables. While sinking the mat the top cables were cut some distance in advance of the rock barge. The mat was sunk at right angles to the current, damming up the least possible amount of water. At the cross-dikes mats over 600 feet long have been sunk with little difficulty. In the opening of the main dike 468.5 squares of foot-mat were placed.

Before the November rise arrived all the cross-dikes had been completed with the exception of an opening left for passing material. Had the low water lasted as long as that of the preceding year all openings would have been closed. The water, finding a straight channel through these openings, rushed through them with great velocity, and the heavy masses of drift striking the ends of the dike damaged them to such an extent that the new dikes had to be driven below the old ones, overlapping these as far as it was deemed necessary. Completing the cross-dikes was very slow work. Steamers could not bring the material to be expended down Elmot chute on account of snags and sand-bars, and nearly all the material had to be towed by hand from a distance.

The moving of barges and material from one point to another forms a large item in this work. At Cross-dike No. 1 advantage was taken of the rise, during the latter part of November, to connect the Tennessee end with the main shore. Ninety feet of dike of two rows were constructed, completing the dike with the exception of an opening left for passing material. This dike was driven to a 15-foot stage, and during the last high water almost all of it was completely covered with sand.

The construction of the Tennessee end of Cross-dike No. 1*a* was pushed at the same time Cross-dike No. 1 was building, completing 125 linear feet of dike of three rows.

Between the second and third rows 190 squares of tipped grillage were placed. The high stage of the river prevented the construction of grillage mat between the first and second rows. During high water the north end of this dike was slightly damaged by drift.

Where the tipped grillage remained in its original position the fill is nearly as high as the dike and extends to Cross-dike No. 1^{b}. At the junction of this dike with the main dike, 150 linear feet of dike of two rows were constructed during September. A foot-mat 100 feet wide and 542 feet long = 542 squares, has been sunk across the entire opening, and 38.5 squares of grillage constructed at the north end of the dike. Operations were continued at Cross-dike No. 1^{b}, and before they had to be suspended on account of high water, 206 feet of dike were constructed at the south, and 528 feet at the north end. A good fill took place below this dike during high water. A bar having formed between the north end of this cross-dike and the main dike, it was deemed impracticable to continue it northward. A foot-mat 100 feet wide and 635 feet long was sunk across the opening, and 620 feet of dike of three rows driven through it, completing the pile-work of this dike. That portion of the dike driven before high water has since been protected by 188.95 squares of grillage.

To prevent any scour between the Tennessee shore and the end of Cross-dikes Nos. 2, 3, and 4, a mattress from 50 to 100 feet wide and 325 feet long was sunk, the perpendicular caving bank graded, and the bank protection carried to the top of the bank. These protections have served to prevent any caving, and the willows of the bank protection are growing nicely.

At the Tennessee end of Cross-dike No. 2, 267.5 squares of mattress and 195 squares of bank protection were placed. The bank was graded for 325 linear feet = 2,599 cubic yards. At the bar end of this dike 591 feet of dike of two rows and 233 feet of three rows were completed before operations had to be suspended on account

of high water. A grillage mat was commenced at the north end of the opening, but only 20 squares could be completed before the riders of the dike were submerged.

This dike shows good results by the shoaling of the water behind it and the enlargement of the bar.

During the month of August a foot-mat 100 feet wide, 763 feet long, was sunk across the opening, and the old dike protected by 268.52 squares of grillage. A dike of three rows 668 feet long has been driven across the opening, completing the dike.

The shore protection for Cross-dike No. 3 was completed to the top of the bank, constructing 270 squares of bank protection. On the bar side of the deep channel a tipped foot-mat was commenced, but only 153 squares could be completed before the dike was submerged. At the bar end 55 squares of grillage were constructed, completing the grillage for the dike, with the exception of a section about 90 feet long, which could not be placed before high water prevented its construction, and during the high water this portion of the dike was scoured out, causing the only breach.

Drift damaged the end of the dike at the opening severely. A large fill has taken place above and below that portion of the dike between the breach and the main dike, but south of the gap hardly any fill can be noticed. In the channel near the Tennessee shore a deep scour took place, which made the closings of openings in Cross-dikes Nos. 3, 4, and 5 impracticable. During the month of August 170 squares of foot-mat were constructed below Cross-dike No. 3 before orders were received from you to suspend operations, it being impossible to obtain piles of sufficient length and in sufficient quantities to close the opening. At Cross-dike No. 4, 135 squares of bank protection were constructed, completing the shore protection; and on the bar side of the channel 242.5 squares of tipped foot-mat were constructed before operations had to be suspended.

The grillage mat was completed for the entire length of the dike, constructing 350 squares, commencing at the main dike, 2,250 feet = 1,012.5 squares of tipped grillage, were placed on the up-stream side of the dike.

The grillage mats at Cross-dikes Nos. 4 and 5 and at the main dike between Cross-dikes Nos. 3 and 4 were constructed on the dry bar, the necessary brush being supplied from the head of Elmot Bar.

To save the transportation of rock across the bar tarred sacks filled with sand were substituted. During high water the sand was washed out of the sacks by reason of their loose texture, allowing the swift current to scour under the mat deep enough to wash out the piles. The tipped grillage in front of the north end of the dike was a decided success, it having been completely covered with sand during high water.

The tipped grillage in front of the bar end of Cross-dike No. 5 was continued for 660 feet=330 squares, and at the Tennessee end 45 squares were constructed before operations had to be suspended. Wattling was placed on piles above the tipped grillage for 90 feet, equal to 8.1 squares. The cause of this dike and Cross-dike No. 4 being damaged to such an extent is most likely to be traced to weakness in construction, the bar end of both dikes having been driven before the standard dike was introduced; all other dikes being incomplete, Cross-dike No. 5 was overstrained.

The water was dammed to a height of from 14 to 18 inches at the first line of piling. Not being able to withstand this excessive strain, the braces, which were 40 feet long, equal to the depth of water in the channel, gave way. To prevent like injury shorter braces are used, the necessary width of dike being obtained by increasing the number of rows of piling. The racking motion which was observed at the widest portions of Cross-dikes Nos. 4 and 5 will be diminished by using shorter braces. Although Cross-dike No. 5 was severely damaged during the high water, a large and high bar was deposited below it; and where the tipped grillage remained uninjured the crest of the bar is 25 feet above low water of 1879. The curve of low water represented on sketch by dotted lines, from April survey, closes below this dike, a deposit of 12 feet having taken place since October, 1883.

Work constructed since November 1, 1883, is represented on sketch by dotted lines.

Very respectfully, your obedient servant,

GEO. W. GENDER,
United States Assistant Engineer.

A. J. FRITH,
Assistant Engineer.

F 3.

REPORT OF WILLIAM A. GOULD, ASSISTANT ENGINEER, UPON OPERATIONS OF THE MATTRESS AND REVETMENT PARTY FROM FLETCHER'S FIELD TO ELMOT LANDING.

MILL BAYOU, ARK., *October* 1, 1884.

SIR: In pursuance of orders from you I have the honor to report the operations of the mattress and revetment party under my charge, subsisting on Q. B. No. 12, since the beginning of this season's work in May (Appendix F 2 and Plate X.)

The work has been confined to the protecting of the river bank below low water from caving. The location of the works is on the Arkansas shore, beginning at a point below Mill Bayou called Fletcher's Field, and the work contemplated extending to Elmot Landing, a distance of 3 miles of concave bank. Work was begun on May 26 just below Elmot Landing, 400 feet above Range "37 A," by building and sinking a woven willow mat, of 78 feet in width and 800 feet in length, where the bank had been attacked by underground seepage, and extensive caving had been operating for several weeks on a bank some 20 feet high. This caving was apparently arrested from extending further down river by a collection of heavy willow stumps, which still retain the top of the bank. This mattress was built on mattress barge and launched off in successive lengths until 804 running feet were completed. Part of the brush was very old, being a remnant of brush on hand at the close of last season's work; the poles were large and heavy cottonwood. Two wire cables, $\frac{3}{4}$ inch, were used on the head and four in the body of the mat, to retain it in position while building, and about 15 per cent. of them expended in sinking. One hundred and twenty-five and nine-tenths cords of new brush, 24 cords of new poles, 37 coils of wire, and 566 cubic yards of stone were expended in constructing and sinking. The mat contained 627 squares, and the cost, including labor, cooks, and waiters, was $389.33. Work began on May 26, and completed June 2, being seven days.

On the 11th day of September hydraulic Grader No. 2 began operations at this point. The strata of the bank for the 6 feet next above the water were composed of sand, which in many cases, where the toe of the slope was protected by the upper edge of the sunken foot-mat, maintained its position and retained its proper slope, while in some portions of the grade large cavities were formed, which will require dressing with shovels.

The operations of the grader covered a period of $7\frac{1}{2}$ days, all machinery working in perfect order. Seven hundred and fifty feet of bank was graded from September 11 to 18, being $7\frac{1}{2}$ days.

The working force consists of foreman, 2 engineers, 2 firemen, 7 men at the discharge, 1 linesman, 1 deck hand, 1 cook, 1 waiter, and 1 night-watchman; total, 17. The cost of this grade for labor was $213.33. The cost of grading per yard was 2 cents.

The extension of the Gold Dust main dike last season to protect the head of Elmot Tow-head, thereby turning the flow of the water from the Tennessee shore, rendered necessary the protecting of the opposite bank of the river on the Arkansas shore by foot-mat and revetment, &c.

On the 3d day of June the plant under my charge was towed up river to a point near Mill Bayou, on the Arkansas shore, 540 feet above Range "31 A." A foot-mat ordered to be constructed 175 feet in width. It was deemed impracticable to construct and maintain the head of this mat at full width. A boom 90 feet long was constructed to form a head-piece, and at each launch the width of the mat was increased, until in 200 feet the full width of the 175 feet was obtained, and afterwards maintained. This increased width was at first obtained by covering more "way poles" on the barge at each launch, but this left square recesses in the sloping edge of the mat, which were imperfect in construction, and served to accumulate and retain floating drift, and a change was made, making the outer pole continuous and maintaining the proper slope, the widening poles uniting where their position was intersected by the outer pole.

Some of the head cables were passed under the boom and made fast in the mat some 40 feet in rear to prevent the head of the mat from "diving" as any strain on the cables tended to raise the boom out of water by the cable trying to maintain a uniform degree of elevation. Five wire cables were used longitudinally, the outer edge of the mat being strengthened the most. This mat was built 2,010 feet long and 175 feet wide—3,426 squares. The material used in its construction was 1,741.41 cords of brush, 198.70 cords of poles, $91\frac{3}{4}$ coils of wire, and the cost of building this 2,010 feet was $1,751.91.

On June 30, the water being 58 feet deep on the outer edge, some 1,500 feet of this mat was sunk, with $1,369\frac{1}{2}$ cubic yards of stone, the remainder during the night sunk by the force of the current, and being attached to the mat-barge at the lower end it tore loose just where the mat was ballasted to the river bottom, and was lost.

On August 2 Grader No. 2 began work at the head of this mat, and worked until

August 16, being 13 days. During this time 1,140 running feet of bank was graded and 11,060 cubic yards of earth were removed, at a cost of about 2 cents per yard; 1,019 feet of revetment was placed (average width 87 feet) on this graded slope, and ballasted with stone for the first 10 feet above the water; that is, from 5 to 12 feet on the gauge, the remainder being left for higher water. The subsequent falling of the river showed that cavities under the inner edge of the foot-mat were completely filled by the action of the grader.

On July 1, while waiting for stone to sink Mat No. 1, a second was begun about a mile down river, immediately below the large drift rack, 750 feet above range "34 A." This mat was of similar construction to Mat No. 1. It was started 120 feet wide on the head and widened to 175 feet. This mat was 1,750 feet long, and contained 3,358.70 squares; was constructed of 1,417.75 cords of brush, 149½ cords of poles, 86½ coils of wire, and the labor expense due to the mat was $2,043.86. It was sunk down-stream in 70 feet of water by using 1,757½ yards of stone. On the 18th of August the grader began work here, and removed 22,198 yards of earth, at a cost of 2.3 cents per yard, leaving a slope of 3 to 1.

This bank had been caving and leaving several large pockets, which were increased in size by the grader. In three of the pockets three thick submats were constructed, covering the sunken ground, and being only secured at their upper edge. the remaining portion being well ballasted, was free to sink and follow down any future caving beneath them, while the revetment mat proper was built continuous above them without connection. These mats were about 70 feet wide and about 150 feet long; they contained 323 squares, 180 cords of brush, 63 cords of poles, and 240 yards of stone. The graded slope at this mat is being covered with revetment and will be completed during the month of October.

On the 4th of August Mat No. 3 was begun 928 feet below range "31 A," and was started to overlap 100 feet of the broken edge of Mat No. 1. A projecting point of the bank rendered the starting of a mat here difficult work, owing to the force of the current. The first and second attempts at starting proved unsuccessful, owing to the breaking of the boom and the parting of head lines. Some 90 feet of mat was destroyed, and the mat boat required repairing. By mooring an empty coal-shed above the head of the mat, to check the force of the top current, and using short head lines to the boom, the third attempt was successful, and 1,713 running feet of mat 175 feet wide was completed; its further extension was stopped by the half mile of drift rack in the river bed below. This mat contained 1,982 cords of brush, 210 cords of poles, 111 coils of wire, and after remaining afloat for 30 days was successfully sunk on September 26, with 1,696 yards of stone, in 48 feet of water, or 42 feet below low-water line. The channel-way was only 15[illegible] feet from the shore, leaving the outer edge of the mat 3 feet higher than the center.

A summary of the work to October 1 will show 4,931 running feet of wide foot-mat, also 800 feet of narrow mat, sunk for low-water protection; 2,000 feet of revetment, partly loaded, and a reasonable prospect that the grader will prepare 2,000 feet of bank for revetment, and that all foot-mat sunk will have its corresponding revetment built and ballasted before any serious rise of the river. An experiment was tried to drive a line of piles in front of a caving bank, and by driving into the deep clay strata and walling on the shore side with willow fascines to check the caving, but the action of the caving was so rapid that before the piles could be secured some were scoured out for lack of a foot-mat, and the experiment was postponed.

It has been difficult to work a full force at any time, owing to the uncertainty of material from the contractor, and the cost of the mat has been largely increased thereby.

Very respectfully, your obedient servant,

WM. A. GOULD,
United States Assistant Engineer.

A. J. FRITH,
United States Assistant Engineer.

F 4.

REPORT OF W. L. SEDDON, ASSISTANT ENGINEER, UPON OPERATIONS AT OSCEOLA UPPER AND LOWER BARS.

OSCEOLA LOWER BAR, *October* 11, 1884.

SIR: I have the honor to submit the following report on the progress and condition of the work at Osceola Upper and Lower Bars for the period from November 1, 1883, to October 1, 1884. During the period work at this point was entirely suspended from January 4 to June 14, and from June 25 to August 14. The work done has consisted

in strengthening Cross-dikes Nos. 1 and 2 with cable bracing, in repairing breaks in Cross-dike No. 3, and in continuing the protection of Osceola Lower Bar with mattress and revetment.

Following the divisions of the work made in the report for 1883, I shall take each under consideration—first, as to work done, and second, as to condition and results.

OSCEOLA UPPER DIKE.

No work has been done on this dike, it having been abandoned on the commencement of Cross-dike No. 1, as stated in report for 1883.

The partial destruction of the dike, which had taken place the previous year, was nearly completed by the high water of 1884, and there now remains standing only about 1,000 feet near the Arkansas shore. This result was to have been expected from the weakness of the structure, cited in the last report. As far as can be ascertained, the 100-foot mattress, previously placed along the dike, remains in good condition.

In considering the results from this dike some difficulty is experienced, as a large portion of the fill which has taken place along its former line should be attributed to Cross-dike No. 1; though that behind the portion still standing has undoubtedly been increased by the action of this work.

OSCEOLA CROSS-DIKE NO. 1.

This dike was strengthened with wire cables, in November, 1883; since which time no further work has been done on it.

The condition of the dike is good, and its action during the high water of 1884 was entirely satisfactory. The structure withstood the strains brought upon it by the large accumulation of drift, without any appreciable damage. In front of the dike, the drift, while it has decreased somewhat in area, a portion of it being freed by the breaking of the lower end of the upper dike, has apparently increased in mass. So much of this drift is now partially imbedded in the bottom, and the whole mass is so closely packed together as to form a raft which would, I think, insure the closing of the chute, even if the dike were removed. The fill in front of the dike has been very marked, and the low-water shore-line now extends beyond the line of the upper dike, as shown in the accompanying sketch (Plate XII). Behind the dike the fill has been extremely large. At its lowest point the chute here is dry at a 10-foot stage of the river; while for about two-thirds of the way across the fill lacks only a few feet of being as high as the adjacent tow-head, and is covered with a thick growth of young willows from 2 to 4 feet in height.

One noticeable feature about this fill. is, that it is composed almost entirely of silt, which shows how completely the current has been checked by the action of the dike. This character of fill, extending as it does far down the chute, and even beyond Cross-dike No. 2, shows also, I think, the area over which the influence of Cross-dike No. 1 extends, and should be attributed to it. Judged by the above condition and results Osceola Cross-dike No. 1 may certainly be considered as an eminently successful piece of work.

OSCEOLA CROSS-DIKE NO. 2.

Thisdike was also strengthened with wire cables in November, 1883; which has been the only work done upon it within the period.

But little change has taken place in the condition of the structure since last report. Neither the eastern nor western sections sustained any noticeable damage from the high water of 1884. The condition of the dike is therefore fair, though the western section has begun to show signs of weakness, apparently more from the action of time upon the perishable material of which it is constructed, than from any other cause. A considerable fill has taken place behind this dike, beside that mentioned as properly attributable to Cross-dike No. 1; the results produced by this dike may therefore be considered as fairly satisfactory.

OSCEOLA MIDDLE DIKE.

No work has been done here during the period. The condition of the dike is bad. As in the case of the upper dike, its previous partial destruction was nearly completed by the high water of 1884. Breakage by drift and bottom scour have combined in producing this result. About 600 feet of dike, in a badly broken condition, still remains standing near the foot of the upper bar. Of the 100-foot mattress sunk along the front of this dike, nothing definite can be said; but judging by the scour which has taken place here it is most probable that at least a portion of it has gone out.

OSCEOLA CROSS-DIKE NO. 3.

The work at this dike, with the exception of the addition of 3,418 square feet of wattling and the sinking of 200 linear feet of foot-mat, previously constructed, has consisted in the repairs of breaks which have taken place in the structure.

On the 14th of November the 200 feet of the dike, which consisted in a row of clusters with inclined braces, began to show signs of weakness, caused principally by bottom scour. Preparations were at once made for strengthening this portion of the dike, but before anything could be done the entire line of clusters gave way, and at the same time a break of 150 feet took place in the front line of the dike proper. The work of repairing this break was commenced on December 2. The repairs consisted in the strengthening of that portion of the dike where the front row was broken, with two rows of piling driven behind and connected with braces to the old dike, and in the driving at the gap of a V-shaped connection of three-row dike, as shown in the sketch. These repairs necessitated the driving of 150 of two and 375 feet of three row dike, all of which was completed by the 15th of December. As soon as the driving was completed the work of making a grillage foot-mat along this new portion was commenced; 419 linear feet, equaling 20,705 square feet of this work, was made and sunk by January 4. On this date all further work had to be abandoned on account of the high water, thus leaving about 100 feet of the dike in an unprotected condition.

An inspection of this work after the high water showed that at the eastern end the water had undermined the revetment, and that the bar had caved back some 50 feet, while about 100 feet of the dike had also scoured out, making a total gap of 150 feet at this end. It was also found that the drift had broken about 100 feet of the dike at the Arkansas end. The repairs of these two breaks were commenced on June 15 and completed by the 25th of the same month, 150 feet and 120 feet of the two-row dike being driven at the bar and Arkansas ends respectively.

The condition of this dike is now good, and its action during the high water of 1884 was very satisfactory, considering the nature of some of the older portions of the structure, for the only damage sustained was that of the two small breaks mentioned above, though the accumulation of drift in front of it was even larger than that at Cross-dike No. 1. This accumulation of drift now amounts to more than thirty acres, and is very closely packed together. The fill in front of the dike has been large, while that behind it has been very marked. From its action and results Cross-dike No. 3 may therefore be also classed as a successful dike.

OSCEOLA DIKES.

Now considering these dikes together, as members of one system, the object of which is the closure of Osceola Chute, their action during the past year has been very satisfactory. A comparison of the fill and scour, which has taken place through the influence of these dikes, from November, 1883, to June, 1884, showed a very large excess of fill. Indeed, with the exception of a small area just behind the middle dike, there has been almost no scour, while the fill has varied from one to twenty feet in height. Therefore, viewed from this standpoint and by these results, the Osceola dikes may, as a whole, be considered as a successful piece of work.

OSCEOLA UPPER BAR.

No work has been done at this point during the period.

The condition of the mattress and revetment previously put in is only fair. The erosion of the bank at the lower end of the bar, where no revetment had been placed, continues, and the water is gradually undermining the revetted portion above. As far as can be ascertained the shore-line of the lower half of the bar has moved back about 100 feet during the period.

OSCEOLA LOWER BAR.

The work at this point from November 1 to December 26 was confined to the sinking of the section of mattress made prior to that time. The long delay in getting stone for this purpose, and the consequent accumulation of drift near the head and along the outer edge of the mattress, made this work very difficult and necessitated the strengthening of the whole section. This strengthening was accomplished by the weaving of wire cables through and the wiring of longitudinal poles on top of the mattress. After this had been done no further difficulty was experienced, and the section of 2,663 linear feet, equaling 406,600 square feet, was successfully sunk by December 26.

On August 14 preparations were begun for resuming work at this place. An examination showed that the head of the bar for a distance of about 1,000 feet had cut back from the old mattress so far as to necessitate the putting in of a new section at this point. A 150-foot mattress for this purpose was commenced at the head of the bar on August 18, and was carried down to the point at which the old mattress still joined the shore. This section, containing 1,337 linear feet, equaling 222,480 square feet, was completed and successfully sunk by September 17.

On September 6 the grading of the bank for revetment was commenced. The work was done with shovels at those points where the grade was already approximate and with hydraulic Grader No. 2 where the bank was steep. By October 1 the grading was completed from the present head of the bar to the end of the mattress thus far constructed, a distance of 3,056 feet. Of this amount 1,636 linear feet was graded with shovels and 1,420 linear feet with hydraulic grader. The minimum slope allowed has been 2½ to 1, which at places has been increased to 3½ to 1.

The grading has been followed up with the revetment as fast as material could be obtained for the purpose, and by October 1,972 linear feet, equaling 61,640 square feet, has been made.

The condition of the mattress previously put in at this point is good, and that portion of it sunk during November, 1883, has served well as a partial protection to the bank.

The above report, together with a sketch showing the present condition of the work and containing a table with full dimensions of all work done during the period, is (Appendix F and Plate XII) respectfully submitted by—

Your obedient servant,

W. L. SEDDON,
Assistant Engineer.

Mr. A. J. Frith,
United States Assistant Engineer in charge.

Work done from November 1, 1883, *to October* 1, 1884.

Kind of work.	Linear feet.	Square feet.	Remarks.
Dike, 2 rows	430	.....	Repairs of Cross-dike No. 1.
Dike, 3 rows	377	.....	Do.
Foot-mat	419	20,705	Do.
Foot-mat, sunk	619	33,305	200 feet made previously.
Wattling	.....	3,418	Cross-d. No. 3.
Mattress	1,337	222,481	Osceola lower bar.
Mattress, sunk	4,000	629,081	2,663 feet made previously.
Revetment	972	61,640	Osceola lower bar.
Bank graded	3,056	.....	Do.

F 5.

REPORT OF JAMES M. RILEY, SUPERINTENDENT, UPON OPERATIONS AT OSCEOLA CROSS-DIKE NO. 4.

Gold Dust, Tenn., *October* 1, 1884.

Sir: I have the honor to present the following report (Appendix F 5 and Plate XI), which concerns the building of Osceola Cross-dike No. 4, constructed during the term for which this report is made, November 1, 1883, to October 1, 1884.

Work was begun May 12, 1884, and forces withdrawn August 5. Without, however, completing the design, 400 feet of second row and 600 feet third remain to be added to the first row. This can be done at 25-foot stage. Falling river did not allow the finishing of this portion, which is on the crest of the bar and midway of the line of dike. It may be as well to say the absence of these rows can in no way affect the integrity of the structure. They can be thrown across so rapidly when the river rises as to cause no apprehension from not being in place.

The line of this cross-dike for the most part is parallel to, and 100 feet above, Range 48½; its length, 2,450 feet, inclosed at either extremity by Osceola-Bullerton main dike and the Arkansas shore.

The object in placing this dike where located was the closure of Osceola Chute, and in this to deflect the body of water entering between the upper end of Osceola-Bullerton main dike and the foot of Osceola Bar, along the outside of the main dike.

This result was to be expected from the action of other cross-dikes, built to attain similar results under almost identical conditions. Osceola Cross-dikes Nos. 1 and 3 will occur to you as fair examples.

It was deemed necessary to conduct the work with the utmost celerity. Instructions were to this effect. It was well known that the slope of the river toward the Arkansas shore, along this portion of the reach, increased rapidly, with decreasing stages of the river.

The bar to be protected from erosion extended westerly from the main dike, three-fourths of the length of the dike to be built. Its height varied from 0 to 20 feet above low water of 1879. The material was fine sand, left by the high water just passing. This would be easily swept away if not protected, giving the river full sway, in an old channel, and so on down through Bullerton Chute. What will be referred to as channel, from the bar inward to Arkansas shore, will be contra to what is termed bar. Already this channel had a width of 600 and depth of 30 feet, 4 feet below low water of 1879; gauge reading, May 12, 26 feet. The current was developing. The water impinging on the Arkansas shore, at an angle of 45°, caused the bank to cut rapidly from range 48½ to range 49.

Soundings revealed scours in excess of the fall in the river, and continued; the gauge marked 13 feet on June the 6th. About this time the 10-foot curve connected through the chute. From June 6 to 20 a rise of 4.50 feet was noted. Then an almost steady fall until the end of July of 6 feet, and, with the exception of a few oscillations, continued until latter part of September, when the gauge was 3.15 feet, the lowest reading. Instructions were received May 10 from you to construct what is known as the standard dike, to be built to high-water mark. This was done in all essential features. At times when exigencies arose the type would be departed from, and at your instance changes would be made looking to the further strengthening of the dike, principally by the use of more timber and wire cables. The mattress work did not follow so closely the method proposed, in that flat grillage was substituted for tipped grillage, no piles being used. What has been termed swinging mattresses were directed to be sunk previous to driving the dike across the channel. The dike as built is as follows: Across the bar from the main dike 1,600 feet, except part mentioned as incomplete, consists of three rows, placed 20 feet apart, of single piles, bents spaced 12 feet. For the remainder, 850 feet, the number of rows increased with the depth of water, the maximum being six rows, 100 feet width of dike in 50 feet of water.

Nothing arbitrary can be said as to the number of piles used in clusters of the different rows; but say from two to six piles, without reference as to the line occupied. About 200 feet from the Arkansas shore the line of the dike was advanced 100 feet, so that the rear line joins the front line and connects at an angle with the line as originally, 500 feet distant, near the bar.

Before the dike was driven eight swinging mattresses were sunk across the channel. These were held in position by mooring clusters while being placed on the bottom. These mattresses were of varying size, 110 by 30 feet to 110 by 85 feet, overlapping 15 feet. The down-stream side, when in position, was just below the front line of the dike, so that the grillage mattress afterward sunk rested on top.

Grillage mattresses extend the length of the dike, heavily loaded with rock. The width changes—least, 50 feet; greatest, 125 feet. An examination of this cross-dike was made a few days ago at your request, you accompanying the party in the sounding skiff.

It was found the drift extended almost to the foot of Osceola Bar. The dike showed no signs of weakening. Soundings in between the rows of the dike, across the channel, show a fill in some places of over 20 feet; in no place less than 5 feet. Behind the dike, 100 feet, the fill was shown to be 15 feet. No scour or tendency could be discovered. These comparisons are made between the greatest depths found in July, and represent the action of the dike during two months. During inspection the maximum depth found was 31 feet, 200 feet out from the Arkansas shore. This place during construction proved more troublesome than any other, registering then 50 feet.

Reducing soundings, the fill at this point is about 6 feet. Below the dike 100 feet, in July 43 feet, in September 17 feet, were the greatest depths, indicating a fill of 13 feet.

Before finally submitting my report some details as to construction will be given. The first trial of swinging mattresses was had at this dike. While experience has since shown the full benefit of the scheme was not derived, their absence would have been severely felt. Had it been feasible to have built them of such a width that all the rows of the dike could have been driven through, the perfection of the idea, greater security, would have been had in closing the opening.

The method adopted to place the sills was to drive clusters, 3 to 8 piles, 100 feet above the dike; spaces between clusters varying from 15 to 75 feet; number of piles in clusters and number of feet spacing increased with the depth of water and velocity of current, or as midchannel was approached.

The flow of the current being from 9 to 10 miles per hour, estimated, and depth of

water 38 feet, with drift in large quantities entering above, must account for peculiar disposition of clusters. Trial was made to drive these at uniform distances, so that they not only would be useful in manipulating the mattress boats and pile-drivers, but serve as a drift-row. The change to wider spaces was because as a temporary drift-row they were too great a success, holding the mass a day or so, then giving way, letting the collected rack-heap down in body upon the works below.

To hold the pile-driver in place, a 2-inch (diameter) line was run from a clump of piles on the inside of the foot of Osceola Bar, distant about 1,800 feet. With the aid of bow anchor on one side and lines to the Arkansas shore, the driver was held reasonably steady. Easily movable ballast was provided in shape of coils of wire. Some clusters were redriven eight times. Two 100-feet mattress boats were provided. It was thought by using both at the same time, end to end, a mattress over 200 feet long could be made, thus gaining time.

The plan followed was to construct a launch on the boats while at shore, in readiness to be moved to the line, which was always done in the morning. After getting into position behind the clusters, ways pointing up-stream, cables, which had been fastened to the piles when driven, whose one end was attached firmly to the pile near the bottom of the river, the other spiked to the top of the pile, were taken off and passed through the mattress. When all was secure a launch made, and as many more as possible during the day. In no case was it thought best to leave a mattress afloat during the night, nor was it done. In every instance the sections were sunk the same day that they were made. Mattress boat taken to the bank, out of the way of the drift, sinking commenced on the lower inside corner, a partially loaded barge of stone placed over this corner. Enough stone was thrown on the mattress to allow the barge to float over it. By repassing all was loaded evenly. Marlin attached to different parts of the mattress determined its position at any time. The endeavor was to force the mattress to remain horizontal in going down, to present no folds until near the bottom, then suddenly sink it to its place. This plan worked well. But one section swerved from its position, and this one because the outer cluster of piles pulled out, but being nearly down was quickly sunk without loss, the remaining cluster holding one-half of it without breaking the mattress. In driving piles pile-driver No. 14, 36 feet leads, frequently handled piles over 80 feet long. She being of lighter draught than those with 46 feet leads, was always placed in swiftest water. The penetration of piles was never less than 20 feet in the channel portion of the dike; were driven without being sharpened.

The mattress party followed the drivers closely, sometimes making grillage mattress by hanging to second row while rear rows were being driven, then connecting through or sinking at once if needed, afterward lapping through with another mattress.

The losses met with were all on account of the lodgment of drift and rafts upon unfinished work. What would equal 400 feet of 3-row dike was carried away during construction; also a section of foot mattress 255 by 110 feet. This is about the total of mishaps, but occurring at different times set the work back greatly.

Delays were frequent, from unavoidable causes.

Respectfully submitted.

JAMES M. RILEY,
United States Superintendent.

A. J. FRITH,
United States Assistant Engineer.

F 6.

REPORT OF AUG. J. NOLTY, SUPERINTENDENT UPON OPERATIONS AT BULLERTON TOW-HEAD AND OSCEOLA-BULLERTON CHUTE.

SIR: I have the honor to herewith submit my report of operations at Bullerton Tow-head and in Osceola-Bullerton Chute for the period included between November 1, 1883, and September 30, 1884.

On November 1, 1883, there remained to be constructed at Bullerton Tow-head 500 feet of foot mattress, 2,700 feet of bank revetment, 600 feet of bank to be graded, and a large amount of bank revetment to be loaded with stone.

The amount of foot mattress to be made had to be augmented by 700 linear feet of 50 feet wide as the river had risen so much that proper connection between low-water bank protection already sunk, and high-water bank protection yet to be constructed could not be made. Hence, this narrow mattress, which should be really considered as so much bank revetment, was constructed and sunk inside of main foot mattress.

At this time both the supply of brush and of stone was very scanty, and it was determined to only finish the high-water bank protection half way up the bank, leaving an upper zone 30 feet wide entirely unprotected.

However, before the water had risen high enough to greatly interfere with the work there was an increase in the supply of material and the work was completed. The loading of revetment could not be entirely finished owing to the rapid rise in the river, and the stone was dumped in piles on the work, the intention being that as the water fell it would be more evenly distributed.

In the early part of January the river began rising rapidly, with much ice running. As the work on Bullerton Tow-head was completed as far as could be done, orders were received from headquarters to find a suitable and safe place for laying up part of the fleet during the flood season. A very safe harbor was found between the tow-head and Arkansas bank, and the work of moving the fleet was at once begun, and continued from day to day until completed. A small force was kept employed during the month securing the work on the outside bank of the tow-head, which they managed to do before the river flooded its bank.

From the latter part of January until the end of May no work except such necessary for the proper care and preservation of public property, and for which a small number of men were retained, was done. By the latter part of May the river had fallen so as to expose about 7 feet of bank, and an examination of the outside of Bullerton Tow-head revealed damage to the work there. A close inspection showed that the damage was caused by seepage from the interior. The action of this seepage water was to soften and slowly wash out the stratum of sand and silt overlying the clay stratum, allowing the upper strata to settle down, and the work to slide into the water.

Operations were at once begun at these places and continued from the 1st of June until the 5th of July, by which date all the damage had been repaired. This work involved the construction of 1,391 linear feet of mattress, from 45 to 50 feet wide, 1,105 linear feet of revetment, and 1,004 linear feet of grading. The mattresses were made in the following manner: A mattress barge capable of constructing a mattress 165 feet wide was brought alongside of the bank, and with its long axis parallel to it and sparred out 25 feet. A grillage of stout poles was then constructed, one edge of it resting on the bank, the other on the upper terminus of the ways of the barge. Upon this grillage a heavy mattress was constructed, and when finished the barge was sparred out from underneath it, the mattress being first fastened to the top of the bank by wire cables in such a manner that it could neither move outstream nor downstream, nor could it slide down the bank after being sunk

Each successive mattress overlapped the preceding one sufficiently to make continuous work. The bank was then graded to a slope of 1 on 3 and the revetment laid thereon. It was supposed that the mattress just described would prevent the oozing out of the semi-liquid sand and silt, and that by grading the bank to a long slope and thus removing much of the superincumbent weight, the tendency to settle down and slide out would be much lessened. The work of repairing was finished on the 5th of July, and at that time the bank presented a fine appearance, all the new work having been uniformly loaded with stone and the older work being covered down to the waterline with a heavy growth of willows.

On the 5th of July the work of closing the chute behind Bullerton Tow-head was begun by commencing the driving of a line of anchor piles across, 150 feet above the line of proposed dike. These piles were driven in clusters of three each, and from 25 to 50 feet apart, the wider spacings being in shallow water. To each pile a wire cable was fastened at such a distance from its foot that when the pile was driven the cable would have entered a few feet into the bottom.

At the same time the construction of footing mattresses at each end of proposed dike was begun, that along the tow-head bank, where no caving was going on, being 200 feet long, while that at the opposite bank, which was a bluff and caving one, was 552 feet. After these mattresses had been sunk the bank above them was graded and high-water bank protection laid thereon.

The object of thus protecting the banks was to prevent caving and cutting around the ends of the finished dike.

As soon as a sufficient number of anchor clusters had been driven, the construction of dike foot-mattresses was begun. These were made 165 feet long each, and varied in width from 75 feet to 100 feet, the wider ones being sunk at such places where the depth of water required the dike to consist of four rows of piling. These mattresses were anchored with cables to the anchor clusters above-mentioned and in such a manner that when sunk from 25 to 30 feet of the mattress would be above the first row of dike, while the entire width was such that all the piles of the different rows penetrated it, each mattress overlapping the preceding one, so that there really was a continuous mattress across the line of dike.

By reference to the sketch accompanying this report (Plate XIV), it will be seen that this dike, which is designated Bullerton Dike No. 2, is nearly completed.

The gap cannot be closed until the upper work is done, as the towing of material is down through it.

As fast as this dike was completed a party followed with the construction of an inclined grillage mattress between the former. The grillage for this work is built upon piles, which latter are so hung with wire cables from the riders that when the mat is sunk the whole will make an angle of 30° with the horizontal, the up-stream ends of piles and edge of mat resting on bottom. Nine hundred and forty-five feet of this work was completed at the end of the period covered by this report, but only about 500 feet sunk, as it was feared that the sinking of more of it might so increase the velocity of the already strong current running through the gap as to seriously increase the difficulty of towing through it.

On September 3 work on Bullerton Dike No. 1 was begun. This dike is a continuation of the section completed the year previous, which, excepting 100 feet of the extreme end, is yet in good condition. Here only the Arkansas bank required any protection, and high and low water bank protection 276 feet long was constructed.

In other respects the work was done as at No. 2; that is, the entire length of dike was first mattressed and the piles driven through the mattress.

In this dike, also, a gap will have to be left until the work on the one at the foot of Osceola Chute has been completed. This latter work consists in strengthing about 250 feet of the previously-constructed dike, and was begun on the date terminating this report.

It has been found that the method of constructing dikes as practiced here, *i. e.*, first laying foot-mattress and then dividing the piles through it, is decidedly the safest plan where the work is subject to scour, and much to be preferred to that where the dike is first constructed, and then a grillage mat built between the piles and sunk. In the former case there is very little trouble from drift getting under the mattress, as the anchor clusters will collect and hold it until the mattress is sunk, and, should any get under it, it will usually work out during the operation of sinking.

When these mattresses are sunk it is quite certain that they lie in good shape on the bottom. In the other case, the drift collecting against the dike, and projecting more or less inside of it, is a serious obstacle to properly sinking the mattress, and, then, where piles are driven in clusters of two or more, as is usual, and where they are more or less spread at bottom, it is impossible to sink it so that it will lie flat.

No difficulty has been encountered in sinking the Dike foot-matresses. One of them, 160 by 100 feet, was lost before it could be sunk by the accumulated drift breaking down the anchor piles to which this mattress was fastened.

This has been the only loss incurred at this work, not a pile driven having been scoured out or otherwise lost.

The maximum depth of water on the line of Dike No. 1 was found to be 28 feet, and at Dike No. 2, 34 feet. An examination of the outside bank of Bullerton Tow-head made in the early part of August, revealed damages to the work there at four places, two of which were at the site of previous repairs.

The damage is not very extensive and has not increased in extent since first discovered. At one of these places the damage is evidently caused by failure of the high and low water protection to properly connect.

This could not be avoided at the time, as after the foot-mattress had been sunk and before the revetment could be laid the water rose considerably.

As it appears evident that the usual method of protecting the banks from erosion will not avail against interior seepage, some other plan will be tried when the repairs are begun.

A series of experiments to determine the best method of counteracting the damage caused to river banks by seepage water has been conducted here with an apparatus designed by Mr. A. J. Frith, assistant engineer in charge. Twenty-four experiments were tried, some of them covering a period of eight days. From these it would appear that a system of lateral and transverse blind drains bedded on the clay stratum will drain these places without injuring the banks. Whether these drains would not in time become choked with the mud to such an extent as to become inoperative can only be decided by tests, covering a long period, in the natural banks. Very favorable results were obtained by driving piles at the foot of the bank, and then filling the space included between the lines of piling and the bank with fascines heavily weighted.

In practice there would be two rows of close piling, one to be driven about equidistant between the foot of bank and the water-line, the other at the foot. The spaces between the first row and the bank, and that between the two rows of piling to be filled in with thick, narrow mattress, and the whole heavily loaded with stone. This work will not extend above water surface, the bank above to be graded and reveted in the usual manner. It is believed that this method will prevent the sliding out of the softened silt and sand composing the bank, while at the same time allowing the seepage water to drain through. It acted thus in the experiments, and will

be tried on the Bullerton bank. The drainage plan will also be practically tested there.

Appended is a summary of work done during the period, and a statement of material expended in construction during the same time. Necessarily, there was a large amount of work done which cannot be properly tabulated, such as removing drift, clearing of banks, removing stone and *débris* from damaged parts of bank, pumping out boats, and other work necessary for the proper care of plant.

The accompanying sketch (Plate XIV) shows the condition of the work at Bullerton Tow-head and in Bullerton Chute on September 30, 1884.

To avoid confusion of lines, the foot-mattress is shown in front of dikes and the inclined one in the rear.

The heavily shading sections of Bullerton Bank show location of damaged parts.

Respectfully submitted.

AUG. J. NOLTY,
United States Superintendent.

Mr. ARTHUR J. FRITH,
United States Assistant Engineer in charge.

Summary of work done from November 1, 1883, *to September* 30, 1884.

Work done.	Bullerton Tow-head.	Bullerton Chute.	Total.
Foot-mattress made ..... squares..	1, 242. 85	3, 393. 7	4, 636. 55
Foot-mattress sunk ..... do....	1, 422. 85	2, 983. 7	4, 406. 55
Revetment made ..... do....	2, 636. 2	1, 039 21	3, 675. 41
Revetment loaded ..... do....	6, 186. 9	856. 11	7, 043. 01
Inclined mattress made ..... do....	.....	647. 9	647. 9
Inclined mattress sunk ..... do....	.....	275	275
Dike finished ..... linear feet..	.....	1, 226	1, 226
Grading bank ..... cubic yards..	13, 327	10, 371	23, 698

Summary of material expended from November 1, 1883, *to September* 30, 1884.

Material.	Bullerton Tow-head.	Bullerton Chute.	Total.
Stone ..... cubic yards..	13, 049. 7	3, 245. 8	16, 295. 5
Brush ..... cords..	2, 737. 9	3, 021. 37	5, 759. 27
Pales ..... do....	139. 5	423. 25	562. 75
Piling ..... feet..	.....	97, 321	97, 321
Wire ..... pounds..	8, 500	11, 000	19, 500
Spikes ..... do....	350	2, 903	3, 253
Coal ..... bushels..	160	1, 883	2, 043
Rope ..... feet..	.....	1, 825	1, 825
Wire cables ..... number..	200	3, 812	4, 012

F 7.

REPORT OF S. P. HATFIELD, ASSISTANT ENGINEER, UPON OPERATIONS AT PLUM POINT DIKES.

PLUM POINT DIKES, *October* 11, 1884.

SIR: In obedience to i nstructions received from you, I have the honor to submit the following report of operations at Plum Point Dikes, covering the period from December 1, 1883, to October 1, 1884.

From December 1, 1883, to December 4, only a small piece of foot-mat was made at the head of the main dike, and work was suspended.

To this time there had been built—

	Feet.
Main dike	2, 008
Cross-dike No. 1	794
Cross-dike No. 2	643
Total	3, 445

March 10 work was resumed with a force of four pile-drivers in charge of Mr. James Anthony, fleet foreman. April 10 I was directed by you to take charge.

The dikes were commenced at a 28-foot stage of water, and kept high near the shore, gradually falling to about 17 feet. The dimentions of the dikes are, width equal twice the height, and up to 25 feet high two piles in front row; above this height 3 piles in front, and 2 piles in the other rows.

When the width of the dike would be over 22 or 23 feet between the rows, 4 rows of piles are intended, as braces longer than this too readily break. Cables lead to the rider of the rear row from the river bottom at front and middle rows; these cables are fastened to the piles before driving. Diagonal braces of cable are stretched from every fourth pile in each row over the top of the dike, and to prevent vibration of the piles in "clumps" of 2 and 3 of front row, they are being wrapped with cables at nearly middle height.

This is found to stiffen the clump. Each pile is lashed to a brace and each brace is fastened with one turn of cable around the pile, and two turns around the rider—braces being notched to prevent slipping, and the lashing so disposed as to meet the pressure. The old method of fastening by drift-bolts and separate strands of wire which were drawn tight by twisting, was abandoned, and cables of various lengths required have been supplied. Experiments made May 7 showed that the cables required for security of the end, fastening at least one and one-half turns with three spikes turned over the cable and clinched into the wood—this rule has been followed in all fastenings.

The pile-drivers lashed the riders to the piles, but the braces were lashed by a "wiring party." This party was organized under a careful foreman, with a view of securing more uniform and thorough work than would have been done by the drivers, whose foremen were apt to be in too much haste to be careful. The foreman of the wiring party also superintends all cable work which requires steam-power of the drivers. In addition I will state, that the orders have been that the piles should be driven at least 16 feet, but near the outer end of the dikes they have been driven 20 feet to allow for some scour. Cross-dike No. 6 was commenced during high-water and about 400 feet built; the strong current here soon scoured the bottom so that about 200 feet of the dike fell in. The wreck, remaining in deep water, proved difficult to clear away, and the dike was rebuilt, starting 300 feet above the former, and where there was 20 feet less water; this was built out 700 feet, and by offset dropped back to original line.

At Cross-dike No. 4, 150 feet of the dike was scoured out, but the wreck was removed and foot-mat laid on which the dike was rebuilt. To carry out the dikes to the distance intended will require 500 feet more on Cross-dike 5, 400 feet on Cross-dike 4, and 100 feet on Cross-dike 3, but there is yet so much to be done to secure the dikes as built, that the extension has been delayed until the mattress work is more advanced.

The matress work began May 13, commencing with "tip-mat" on Cross-dike 3. This mat rests on piles inclined from the bottom of the front row of piles to near the rider of the back row. There are as many of these inclined piles as there are piles in the front row. They are suspended from the middle rider by two parts of cable and two parts also leading to the rider of the front row. The frame of the mat is hung by wires until the mat is complete. The wires are cut and the mat dropped and loaded until sunk. In this mat the small end of the brush is at the top and bottom; the bottom extends from 10 to 15 feet outside the dike. The brush is laid diagonally in the dike to receive the support of the inclined piles in addition to the frame.

In deeper water, and where it is necessary to secure the dikes from scour before a tip-mat could be made, a flat grillage has been made.

At dikes 3 and 4, before the outer ends could be built, it was necessary to lay a foot-mat. Along the face of the main dike a foot-mat 100 feet wide has been placed—also the same around the end of Cross-dike No. 6, extending 200 feet back. For the security of the dikes and proper sinking of mat, great care has been taken to prevent drift lodging, and to remove it when so lodged. Drift rows of piling were made above dikes 3, 4, and 5, and were very useful, although considerable drift would come through, yet not too much to handle. To remove the drift a party worked ahead of the mat party and fastened the drift to the drift row, or passed it back to where the mat was sunk and let it go on the dike. The appearance of the water behind the tip-mat showed whether it was well on the bottom, and where holes were apparent we have placed small pieces of foot-mat over the hole. As the water has receded so that the effect of the tip-mat can be seen, it shows that where the small end of the brush is resting well on the bottom a deposit is soon made over this brush, and the current checked; but if the mat is held up by any drift, scour occurs; there is also no deposit if the butt end of the brush is down.

During low water we were able to improve several such places, and also distribute the rock better over mat sunk in high water.

As directed, no tip-mat has been built at Cross-dike No. 6, but a grillage has been laid through it, except a small piece which will soon be completed. Bank protection

has been completed on Cross-dike No. 4 and that on Cross-dike No. 5, except loading and grading done at No. 6.

The mat party had trouble from reefs forming above the dike, so that barges of brush and rock could not be brought in. Some of this has been transferred to flats and some had to be carried over dry ground.

In working from the lower side of the dike the brush has to be turned over and passed through the dike and cables; the rock also has to be carried over the rear of the mat, which processes are slow and troublesome. It has been resorted to when it was necessary that the mat should be built and sunk.

Consolidated report, mattress work, Plum Point Dikes, from May 13 to October 1, 1884.

Dike.	Foot-mat.		Tip-mat.		Grillage-mat.		Bank protection.	
	Lin. ft.	*Sq. ft.*	*Lin. ft.*	*Sq. ft.*	*Lin. ft.*	*Sq. ft.*	*Lin. ft.*	*Sq. ft.*
Main	1,693	169,900	.....	.....	.....	.....	.....	.....
Cross-dike No. 1	.....	.....	.....	.....	.....	.....	.....	.....
Cross-dike No. 2	.....	.....	.....	.....	.....	.....	.....	.....
Cross-dike No. 3	.....	.....	1,800	112,085	300	21,000	220	8,140
Cross-dike No. 4	.....	.....	1,725	107,495	510	35,700	200	15,000
Cross-dike No. 5	.....	.....	516	36,150	.....	.....	.....	.....
Cross-dike No. 6	650	65,000	.....	.....	2,850	178,825	.....	.....
Total	2,349	234,900	4,041	255,730	3,660	235,525	420	23,140

Dike.	Materials.			
	Stone.	Brush.	Poles.	Wire.
	Cu. yds.	*Cords.*	*Cords.*	*Coils.*
Main	847.3	1,067.1	64—	50.4
Cross-dike No. 1	.....	.....	.....	.....
Cross-dike No. 2	.....	.....	.....	.....
Cross-dike No. 3	1,129.8	1,415.4	136—	66.9
Cross-dike No. 4	1,204.8	1,506.8	153—	72.2
Cross-dike No. 5	270.0	347.7	39—	16.4
Cross-dike No. 6	1,888.5	2,359.0	219.8	111.6
Total	5,340.4	6,696.0	611.8	317.5

Month.	Labor secured (days).	Labor lost (days).						Total.
		Sick.	Pulling drift.	Moving barges.	Sundays, &c.	Rain.	Miscellaneous.	
May	771.7	.....	20.6	20.2	59.5	.....	7.5	879.5
June	1,799.3	.....	225. —	173.9	424. —	55.2	6.1	2,683.5
July	2,005.7	.....	85.9	200. —	357.5	46.2	34.7	2,730.0
August	2,000.3	.....	38.2	133.6	431.5	17.0	55.4	2,676.0
September	1 818.4	.....	.....	14. —	336. —	53.8	325.8	2,548.0
Total	8,395.4	.....	369.7	541.7	1.608.5	172.2	429.5	11,517.0

Consolidated report pile-driver operations, Plum Point Dikes, from March 10 to October 1, 1884.

	March.	April.	May.	June.	July.	August.	September.	Total.
Days work of drivers:								
On dike	57	162	295	312	219	351	197	1,593
On mattress	.....	.....	23	80	38	45	28	214
Piles driven	527	891	1,899	1,449	796	1,230	480	7,272
Riders and braces	216	616	879	942	386	738	524	4,301
Hours (10 per day, each driver):								
Driving	450	1,109	2,239	2,012	1,172	1,689	806	9,477
Lost—								
Changing position	23	37	82	136	77	154	81	590
Coaling	4	21	28	57	50	95	64	319
Splicing line	.....	3	21	11	5	17	13	70
Lifting anchor	.....	12	60	32	42	4	11	161
Cleaning boiler	20	48	120	120	76	142	64	590
Rain	21	57	42	134	64	17	44	379
Out of—								
Piles	.....	185	38	55	329	593½	19	1,219½
Cables	.....	4	.....	5	87	21	3	120
Miscellaneous	47	111	77	195	143	204	65	842
Totals	115	478	468	745	873	1,247½	364	4,290½
On dike—								
Wiring	.....	30	219	381	109	542½	578	1,859½
Miscellaneous	.....	.....	10	8	34	12	25	89
Totals	.....	30	229	389	143	554½	603	1,948½
On mattress—								
Pulling drift	5	1	36	264	204	91	77	678
Placing piles	.....	.....	189	415	157	300	100	1,161
Moving barges	.....	2	2	16	5	74	87	186
Miscellaneous	.....	.....	18	79	15	4	213	329
Totals	5	3	244	774	382	469	477	2,354
Force, including pile-party and wire-party—								
Foreman	81	223	425	524	368	546	340	2,507
Engineers	69	187	363	464	329	476	284	2,172
Firemen	69	187	363	464	315	444	256	2,098
Laborers	393	1,181	2,447	2,906	1,924½	2,801	1,720	13,372½
Others	44	72	124	120	124	124	139	747
Materials:								
Feet of piling	36,910	76,173	138,979	119,790	66,706	98,753	49,608	586,919
Cables	420	697	4,500	4,568	2,196	4,453	3,308	20,142
Staples	235	129	473	898	107	.....	.....	1,842
Spikes	1,213	3,230	29,539	29,140	12,459	29,255	23,589	128,425
Drift-bolts	731	1,741	244	.....	.....	.....	.....	2,716

Number of dike.	Work performed (linear feet).														
	Previous to December 1, 1883.					December 1, 1883, to October 1, 1884.					Total to October 1, 1884.				
	Line.				Complete.	Line.				Complete.	Line.				Complete.
	1.	2.	3.	4.		1.	2.	3.	4.		1.	2.	3.	4.	
Main	2,008	2,008	2,008	...	2,008	1,017	1,017	1,017	950	1,017	3,025	3,025	3,025	950	3,025
Cross-dike, No. 1	794	794	794	...	794	191	191	191	...	191	985	985	985	...	985
Cross-dike, No. 2	643	643	643	...	643	957	957	957	...	957	1,600	1,600	1,600	...	1,600
Cross-dike, No. 3	.....	.....	.....	...	.....	2,100	2,100	2,100	...	2,100	2,100	2,100	2,100	..	2,100
Cross-dike, No. 4	.....	.....	.....	...	.....	2,000	2,000	2,000	...	2,000	2,000	2,000	2,000	..	2,000
Cross-dike, No. 5	.....	.....	.....	...	.....	2,200	2,200	2,200	200	2,200	2,200	2,200	2,200	200	2,200
Cross-dike, No. 6	.....	.....	.....	...	.....	3,100	3,100	3,100	...	3,100	3,100	3,100	3,100	...	3,100

Consolidated report pile-driver operations, Plum Point Dikes, &c.—Continued.

	Division of force.				
	Foremen.	Engineers.	Firemen.	Laborers.	Others.
Pile party	166	.....	.....	1, 287	.....
Wire party	135	.....	.....	1, 343	.....
Pile-drivers	2, 206	2, 172	2, 098	10, 742½	747
Total force	2, 507	2, 172	2, 098	13, 372¼	747
Lost by Sundays and holidays	344	298	290	1, 809	100
Labor secured	2, 163	1, 874	1, 808	11, 563½	647

A small portion of the mat remains to be loaded when the stage of water is more favorable. The extent of the dikes obliges us to move barges a long distance by hand; this has consumed much time. Steamers have not been able to assist much. In this handling of the barges the drift row of piling has been very useful.

The map and tabular reports accompanying (Plate XIII) show the location, character, and amount of the work performed, and other items which may be of interest. It gives me pleasure to refer to the valuable assistance I have received from Mr. James Anthony, fleet-foreman, and Mr. G. Holmes, as boarding-master.

Very respectfully,

S. P. HATFIELD,
United States Assistant Engineer.

A. J. FRITH,
United States Assistant Engineer.

F 8.

REPORT OF F. A. YEAGER, ASSISTANT ENGINEER, UPON OPERATIONS AT CRAIGHEAD'S POINT.

SIR: I have the honor to submit herewith my report of work done between Station 56 A and Craighead's Point from August 5, 1884, to October 1, 1884.

On August 5 a mat 150 feet wide was started about 100 feet below Station 56 A, and from the 5th to the 27th 1,197 feet were made and 1,097 feet sunk, 100 feet having been lost in sinking.

On the 28th a new mat 175 feet wide was commenced, with a heavy boom of cypress piling. Thirty-three feet of mat were made on the barge before shifting, and on September 2 an attempt was made to launch it, but owing to the strong current, the instant it struck the water the boom broke, and the mat doubled up and slid from the barge. This piece of mat, 33 feet by 175 feet, was sunk near the shore, and on the 3d a new one, 150 feet, was started with a boom three pliing in thickness.

On the 5th this met the same fate as the other.

From the 6th to the 8th the bank was cleared preparatory to grading, and on the 9th another mat 175 feet wide was started, with two booms ten feet apart, and seven piling running up into the mat, which was commenced on the upper boom. On the 16th 38 feet were successfully launched, and held by seven lines and two wire ropes. Drift began to collect almost imperceptibly, and on the 20th the two wire ropes parted, causing the head of the mat to sink about 2 feet. On the 25th enough drift had collected to sink it 3 feet more. A large force of men was kept at work removing the drift, and on the 27th the mat looked in good condition, and preparations were made for sinking on the 29th.

The mat was now 581 feet in length, and held by six 2-inch and seven 1½-inch lines and one wire rope. On the morning of the 29th all lines parted, and the mat and mat-barge and three other barges were carried down the river.

These were landed by the Kirus, and towed back by the Kirus and Itaska.

Another mat 150 feet wide has been started, but, as per orders, it will not be launched until drift stops running.

At the place where these mats were started the river is less than 2,000 feet wide, and, as will be seen by the accompanying sketch (Plate XV), the current strikes straight into the bank at that point, making it very difficult to hold a mat there.

Caving is taking place rapidly just below the mat, but very little has taken place behind the mat.

The sand-bars on sketch are not taken from survey.

Very respectfully,

F. A. YEAGER,
Assistant Engineer.

ARTHUR J. FRITH,
United States Assistant Engineer.

F 9.

REPORT OF NEVILLE B. CRAIG, ASSISTANT ENGINEER, UPON SURVEYS, PLUM POINT REACH.

ASHPORT, TENN., *October* 17, 1884.

SIR: In accordance with instructions, I have the honor to submit the following report for the eleven months ending October 1, 1884 (Appendix F 9, and Plates I, II (2 sheets), III, IV, V, VI, and VII.)

The following is a brief summary of work done by the survey party. [Here follows a statement showing that the time of this party was well occupied.—J. G. D. K.]

During the period embraced by this report fourteen measurements of discharge were made at Fulton. The four channels at Bullerton were gauged September 15.

The meter party, under Assistant Engineer Riley, was detached from the main party, and engaged upon current observations from December 19 to February 28.

Below are given the results of all the discharge observations made subsequent to February 24. Those made previous to that date by Assistant Engineer W. H. Powless, then in charge of the party, were probably reduced and the results sent away without retaining copies. At least I can find none here.

DISCHARGE OBSERVATIONS.

	Fulton gauge-reading.	Area of cross-section.	Mean velocity per second.	Maximum velocity per second.	Discharge per second.
At Fulton, November 1, 1883, *to October* 1, 1884.					
		Sq. feet.	*Feet.*	*Feet.*	*Cubic feet.*
February 25, 1884	33.56	169,635	8.64	11.54	1,466,446
February 26, 1884	33.56	170,762	8.39	11.76	1,432,774
March 12, 1884	31.45	167,760	6.34	7.82	1,067,686
March 19, 1884	31.80	167,160	7.70	9.32	1,286,273
April 3, 1884	34.97	178,200	8.26	10.48	1,472,150
April 25, 1884	30.55	161,550	7.43	9.15	1,201,025
April 26, 1884	30.47	161,550	7.14	9.04	1,153,450
May 8, 1884	29.10	153,610	6.987	8.47	1,073,313
May 9, 1884	29.52	154,722	7.21	9.08	1,115,605
May 24, 1884	21.65	131,340	4.50	5.82	591,359
June 21, 1884	20.55	131,480	4.49	5.67	590,063
August 6, 1884	14.34	112,190	3.441	4.15	386,117
September 16, 1884	6.90	92,710	2.603	2.33	180,710
Near Fulton Section, head of Island 34.					
May 9, 1884	29.44	209,120	4.452	5.11	931,018
Bullerton, September 15, 1884.					
Bullerton Chute	7.15	20,480	1.65	2.065	33,895
Channel outside Bullerton	7.15	23,020	1.666	2.577	38,349
Middle Bar Channel	7.15	13,340	3.348	4.252	44,662
Yankee Bar Channel	7.15	13,600	1.920	2.627	26,186
Total discharge					143,092

The meter party, under Mr. Riley, failed to accomplish anything owing to the strong current at the old Fulton gauging section, and the inability of the launch to do the work required of her. All the results given below were obtained by the method of double floats.

It will be observed that two sections were gauged at Fulton on the 8th and 9th of May.

The first gauging was done on the old gauging section. Then the new gauging section, just above the head of Island 34, was gauged; after which discharge observations were again made on the old section.

The two sections were opposite in character, the old being narrow and deep, the new wide and very shallow. They were so situated that gauging them was equivalent to gauging behind a submerged dam and then on its crest.

As anticipated, widely divergent results were obtained, as the following comparison will show:

	Date.	Time.	Area.	Mean velocity per second.	Discharge per second.	Fulton gauge reading.
			Sq. feet.	*Feet.*	*Cubic feet.*	
Old section observed	May 8	10.21 a. m.	153, 610	6. 987	1, 073, 313	29. 10
Do	May 9	2.45 p. m.	154, 722	7. 210	1, 115, 605	29. 53
Old section computed	May 9	10.00 a. m.	154, 537	7. 173	1, 108, 494	29. 44
New section observed	May 9	10.00 a. m.	209, 120	4. 452	931, 018	29. 44

The third column is computed from the first and second, on the supposition that the area and mean velocity vary uniformly with the gauge-reading during the interval. The constant variation in the cross-section at the old gauging section is deserving of careful study. I am convinced that the section constantly endeavors to adapt itself to the discharge, but when a sudden change in stage occurs, the section is larger or smaller, as the case may be, than the discharge requires; and at such times gauging is erroneous from considering an area that is either not wholly effective for discharge, or so much less than the discharge requires that for the time being the law of velocity in a vertical plane is changed. A number of facts lead to this conclusion, but additional observations taken with particular regard to this subject are required before the inference can be regarded as fact.

It is my hope that discharge measurements may be in future a more prominent feature in the work of the party.

THE LEVEE SURVEY.

This survey was begun June 24, under instructions to make a survey, plans, and estimates for a levee that would prevent the escape of water over Plum Point. The first part of the work involved a survey of the old Ashport levee, extending from Ashport to the bluffs, 8 miles back. Cross-sections of the levee were taken every 100 feet and at many intermediate points.

I found the levee in a very fair condition, but it seems to have been built on the supposition that high water at the bluffs would be about the same level as at Ashport, while as a matter of fact there was a difference in the high water of 1882 at the two places of about 4 feet, being highest at the bluffs.

As a consequence, almost the first flood after its construction ruined it, and the badly damaged portion is all at the end next the bluffs, while near Ashport the levee is for a long distance still perfect. From Ashport our location is along the river, at varying distances from it, to the head of Yankee Bar. It then follows a ridge back of Crutcher's Lake and strikes the main bank of Old River back of Flower Island, which it follows for a mile and a half, and then runs directly to Coal Creek, which it meets about 1 mile above its mouth.

I regret that deficiency in the office force and the short time allowed for the preparation of this report render it impossible for me to present the results of the survey here.

The line was completed August 31.

SUMMARY OF CHANGES ON THE REACH.

A map showing scour and deposit on the entire reach was made some months ago, but without a pantagraph I am unable to make a reduction of it to a smaller scale in time for this report.*

* Blue prints of this were distributed to the Mississippi River Commission. The map, if reproduced here, would be apt to mislead, as the comparison was of low-water stage, with a following intermediate falling stage. Results shown would be greatly modified by the following falling river. J. G. D. K.

In an accompanying diagram (Plate III) I have, however, given graphically a comparison of effective low-water cross-section areas for three surveys, viz, that made in the fall of 1881, that of October, 1883, and the last general survey, made in May and June, 1884. Maps are also submitted showing the condition of the river in the vicinity of Bullerton Towhead (Plate VII) and the Gold Dust Dikes (Plate VI) from surveys made during the lowest water of the season. Accompanying each of these two maps are comparisons (Plates IV and V) of the present condition of the river in the localities mentioned with that shown by the survey of October, 1883.

The most remarkable and sudden changes on the reach are those which have occurred in the Bullerton Channels. During the last high water a general deposit took place over nearly the whole area of Bullerton Chute, as shown by the survey of April 15, and just outside the opening in the Osceola-Bullerton Dike; this deposit attained a maximum depth of 27 feet.

Such an obstruction in what had been the main channel brought an increased force against the weaker portion of the dike at the foot of Osceola Bar, and it gave way.

A large amount of water began passing into Bullerton Chute through the break in the dike, and scoured the channel deeper as the water fell.

At a lower stage a general deposit in the main river opposite and below Bullerton resulted, and the extremely unfavorable state of affairs shown by the survey of May 22 ensued. The building of the cross dikes on ranges 48½ and 51½ in Bullerton Chute went far, however, to rectify the mischief done, and in a few weeks' time the river cut a steamboat channel through the immense bar in the middle of the river, as shown by the survey of August 4. This cut through the bar, by diminishing the current in the channel just outside Bullerton, acted rather unfavorably upon the old Bullerton crossing at Bullerton light, which for a time became extremely troublesome to all the larger steam and tow boats, until about the middle of August they abandoned it entirely in favor of the middle-bar channel. This state of affairs existed during the latter part of August and the first fifteen days in September. The extension meanwhile of Dike No. 6, the lowest of the Hotchkiss dikes, was operating gradually to make the middle-bar channel difficult of entrance above, narrow and crooked in places below. Steamboats frequently ran aground, and in one instance a fleet of five barges of the Saint Louis and Mississippi Valley Transportation Company broke and ran aground in it.

About this time the Bullerton survey of September 13 revealed the fact that the old Bullerton crossing had been scouring and straightening itself, and that there was a clear 12-foot channel for the stage then existing.

A few days later all the boats in the river were using this channel, and the middle bar channel was completely abandoned.

CAVING BANKS.

The following are the most noteworthy cases of caving banks on the reach:

(1.) On the Arkansas side of the river immediately above Daniel's Point a large amount of caving occurred during the subsidence of the last high water.

(2.) Some caving has been going on constantly on the outside of Ashport Bar, R. 22–24, but is not important.

(3.) On the Tennessee side, between R. 22 and R. 26, the caving is quite rapid during the falling stages succeeding high water. This caving attains its maximum at a point above 750 feet below R. 25, where between the surveys of October, 1883, and April, 1884, the caving amounted to 400 feet. The significance of this fact is seen when it is stated that from R. 21 to R. 25 several sloughs and low banks permit an enormous volume of water to escape into the low ground a quarter of a mile beyond where the levee survey shows a dry lake or slough of immense size leading directly to Coal Creek. Every foot that caves here serves to weaken the slight barrier that now remains, and increases the probability that Plum Point may, before long, be called Plum Island.

(4.) From R. 30½, just below Fletcher's, to R. 36, at Elmot, the worst case of caving on the reach occurs.

From October, 1883, to May, 1884, the caving was as follows: R. 31=100 feet; R. 32=210 feet; R. 33=385 feet; R. 33½=700 feet; R. 34=385 feet; R. 35=10 feet; R. 36, slight.

Since the May survey, the caving has been more rapid on the lower ranges near Elmot, and not so great upon those above.

(5.) There has also been considerable caving going on between ranges 34 and 36, inside Elmot Bar, which, on range 35, amounts to about 270 feet, between October, 1883, and the present date.

(6.) On the Arkansas side, back of Bullerton Tow-head, R. 50½–R. 54, the maximum caving amounts to about 100 feet, between October, 1883, and May, 1884.

(7.) Between the same dates, the head of Yankee Bar has receded 740 feet downstream.

(8.) The whole shore-line on the Arkansas side, between Pettey's Landing and R. 70, at Craighead Point, has been caving rapidly. From October, 1883, to June, 1884, the greatest caving was between R. 61 and R. 71, reaching its maximum at R. 63½, where it amounted to 380 feet. Since June, 1884, the caving has been more rapid above, and principally due to the impinging force of the strong current passing through the middle bar and Yankee Bar channels.

I regret that the brief time allowed for the preparation of this report has rendered it impossible for me to even gather together and examine many of the maps and computations on file at Elmot and at Cairo, which would be absolutely necessary to make this report thorough and complete. My present assistants, Messrs. Maurer and Sturtevant, as well as those lately connected with the party, Messrs. Hirvi and Hall, have rendered valuable service.

Mr. Maurer, particularly, is deserving of the greatest credit for the faithful and painstaking manner in which he has done the draughting and made all necessary reductions.

Mr. Herman, though only serving as level rodman, has frequently done efficient service with the transit.

Very respectfully, your obedient servant,

NEVILLE B. CRAIG,
United States Assistant Engineer.

A. J. FRITH,
Assistant Engineer.

APPENDIX G.

REPORT OF CAPTAIN CLINTON B. SEARS, CORPS OF ENGINEERS, UPON OPERATIONS IN THE SECOND DISTRICT.

(Maj. A. M. Miller, Corps of Engineers, U. S. A., in charge, to September 1, 1884; Capt. Clinton B Sears, Corps of Engineers, U. S. A., in charge (temporarily) since September 1, 1884.)

This district extends from the foot of Island 40 to the mouth of White River. The improvements of two reaches only in this district have so far been contemplated, viz, the Memphis and Helena reaches. Owing to a want of funds, nothing has been done on the latter reach beyond a survey, nor has any project for its improvement been made.

1. *Memphis Reach and Harbor.*

(Assistant Engineer W. M. Rees, in local charge.)

The original project for the improvement of this reach, submitted by Major Miller and approved by the Commission, contemplated the narrowing of the river below Island 40 to an average of 3,000 feet by closing Beef Chute, east of Island 40 (in first district), by building up the bar from Ash Slough Bend and at the bend above Mound City; to close Frame's Chute at high water, and to hold the caving banks in Hopefiell Bend, on the Arkansas side, and to do the same on the Mississippi side from Frame's Chute to mouth of Wolf River, and below the latter as far as may be necessary for the preservation of the city front. Below Fort Pickering to close the chute to the east of President's Island by dikes.

This project has been carried out only as far as relates to the revetment work in Hopefield Bend, and above and below the mouth of Wolf River. No dike work has been done.

Revetment work has been carried on at intervals through two years as rapidly as the funds available and the state of the river would permit.

HOPEFIELD BEND.

This revetment consists of a subaqueous mattress, about 140 feet wide, and an upper bank brush revetment laid on a graded bank and well ballasted with stone. Up to November 1, 1883, 6,700 linear feet of subaqueous mat had been sunk and 4,100 linear feet of upper bank protection had been placed.

During the last eleven months the work has been carried on as energetically as possible, but under many adverse circumstances, and has been attended with many losses, caused by drift accumulations and strong currents. Much damage has been done by the flood to the work at the head of the bend, and all of the subaqueous

mattress from where the upper bank revetment ended down to the end had disappeared after the flood.

This is supposed to be lying on the bottom of the river, and may have some beneficial effect in retarding the deepening of the channel were it lies.

The flood of 1884 left only some 5,700 linear feet of bank protection in fair shape. No caving of importance took place along this piece, but below it where the upper bank had not been revetted extensive caving took place.

The revetment at the upper end of the bend has been repaired and the subaqueous mat and upper bank protection has been continued down-stream from the end of the uninjured portion of last spring.

The subaqueous mats have been made wider and stronger, the upper bank protection has been made thicker, and greater care has been taken to connect the upper and lower bank revetments.

It is expected that the main portion of this work will be completed before the next high water.

For details of manner of construction, cost, progress, and condition of work, October 1, 1884, see Assistant Engineer Rees's report herewith, marked Appendix G 1 and map marked Appendix G, Plate I.

MEMPHIS HARBOR.

The work here is local and for the protection of the city front, which is covered with costly buildings, such as elevators, cotton sheds, warehouses, oil mills, railroad depots, &c.

Just below the mouth of Wolf River the whole main channel of the river strikes the shore almost at right angles; the current is very strong and the channel very deep, having at some places 100 feet at 11.4 feet on Memphis gauge, and this within 300 feet of the shore.

These conditions, taken in connection with the hindrance from buidings on top of the bank and extending down to the water the constant use of the banks for steamers, barges, ferry landings, coal flats, and railroad transfer landings, cause any attempts to protect this front to be attended with many and serious difficulties.

An effectual protection should consist of a continuous subaqueons mattress, at least 300 feet wide, of double thickness and well ballasted with stone; of an extra thick and strong upper bank revetment, solidly covered with stone, and laid on a grade not less than one to four, and of a strong brush mat connection, woven into the upper work and lapping well over the lower work.

These conditions we have been unable so far to fulfill as regards width of lower mat. The two abortive attempts to sink wide mats are described in Mr. Rees's report.

The reason of this failure was that these mats were not strong enough to stand the great cross-strains thrown onto them while sinking. Had it been practicable to have evenly distributed the strains on the lines and rods, so as to have given equal bearings, it is possible the mats would have proven sufficiently strong. The factors in the problem are, however, so uncertain that it will be necessary to add large factors of safety to the mat to allow for unequal strain.

Preparation had been made for a new mat, 250 feet wide, to begin just below Wolf River, and the rods, rope, &c., prepared, when the river suddenly rose some 8 or 9 feet, bringing down considerable drift and greatlyincreasing the current, and it was deemed advisable to wait for lower water.

In the fall of 1882 two mats, each 120 feet by 60 feet by 2 feet, were sunk in front of the cotton platform at the foot of Winchester street, and 14 mats of the same dimensions each (except one which was 120 by 40 by 2 feet) were sunk parallel to each other and extending from the foot of Market street to the foot of Poplar street.

In 1883 five mattresses, each 120 by 60 feet, were sunk, three near the cotton compress and two in front of the city landing, and the bank was graded and revetted from the elevator to the cotton compress.

Owing to limited means this work was put only at the points of greatest danger, but being fragmentary and detached did but little good.

Upon the allotment of more ample funds the continuous upper and lower revetment was projected and has been carried out as effectively as possible in the face of the difficulties encountered.

Portions of the two wide mats that broke in sinking were secured and sunk in front of the elevator. A subaqueous mat 150 feet wide now extends from a point about 500 feet above Wolf River, continuously across the latter and down to near the foot of Jefferson street. This overlies the mats previously put down and the two portions above mentioned for a distance of 960 feet, and in front of the elevator there are three thicknesses.

But little trouble has been experienced in sinking this mat, and no loss.

The upper bank has been graded to the foot of Exchange street, and about 500 feet has been revetted and well ballasted.

It is expected that the grading and upper bank protection will be completed to the foot of Jefferson street, where the levee pavement begins, and the narrow lower mattress sunk to the foot of Beale street before high water; also, a sill mattress laid fore and aft in Wolf River and extending well out across the present shore mattress.

If the next attempt at sinking a wide mattress be successful, its construction will be continued down as far as the money and season will permit.

FINANCIAL STATEMENT.

Memphis Reach and Harbor.

Amount allotted by appropriation of—	
August 2, 1882	$325,000 00
January 18, 1884	90,000 00
July 5, 1884	200,000 00
	615,000 00
Total amount expended to September 30, 1884	431,672 97
Balance available, October 1, 1884	183,327 03
In treasury	110,000 00
In hands of Captain Sears	73,327 03
	183,327 03

The condition of the records in this office is such that a classified statement of expenditures previous to September 1 is impossible, Major Miller having taken his retained vouchers with him, and there being no copies on file.

For details of construction, cost, and condition of work, October 1, 1884, see Assistant Engineer Rees's report herewith, and map.

SUMMARY.

As the work so far done on this reach is only preliminary and partial, is is not deemed advisable to attempt any comparisons with a view to determining the improvement brought about by the work so far done as regards channel improvement.

It is not expected that bank revetment will have any positive effect in improving a channel-way. The good to be expected is negative to the extent of holding a certain amount of earth in place and keeping it from washing into the channel and forming bars below.

It is positive to the extent of maintaining a regular and well defined channel and in preventing a cut-off, which might unsettle the regimen of the river for miles below.

The original project has been set forth above. No important changes have been made in the general plan.

The total amount expended to November 1, 1883, was $268,269.64. During the eleven months ending October 1, 1884, there have been expended $163,403.33. During the next year, $400,000 can be profitably expended towards carrying out the original project. With this it is proposed to revet some 15,000 linear feet of bank, and to build some of the pile dikes.

My experience shows me that the estimate made by Major Miller in November, 1882, was much too low, and I have estimated my revetment work at $20 per linear foot, and dike work at $8 per linear foot.

The advantages and benefits to be expected from this expenditure are those incident to the completion of the general project for the reach, viz: Narrowing and deepening the channel, giving its banks stability and protecting the valuable property along the Memphis City front.

An estimate for the entire and permanent completion of the work of improvement on this reach, I am unable to give, not knowing the intentions of the Commission as to the ultimate extent of the works.

As this work is only one link in the chain of general improvement of the river, the amount of commerce and navigation that will be benefited is that incident to the whole river, a statement of which has already appeared in a previous report of the Commission.

The present estimated value of the plant, tools, and outfit on hand belonging to the reach is $118,000.

LEVEES.

The funds for levee construction in this district having been exhausted at the date of the last annual report, no levee work has been done. From the July appropriation for 1884 the Commission allotted $160,000 for the repair and preservation of levees in

the second, third, and fourth districts, this to be divided by the board of district officers. The division was made, and $20,000 conditionally allotted for repairs to levees on Yazoo Front, second district.

The conditions of its allotment having by September 10 not been fulfilled, this money reverted to the Yazoo Front, third district. Since then, however, the local levee authorities of the Yazoo Front, second district, have succeeded in negotiating their bonds, and contracts have been made for the expenditure of some $500,000 in levee work.

The Commission also allotted $15,000 for the repair and strengthening of the Long Lake Levee in Arkansas, providing the levee from Helena to Long Lake shall be repaired and raised to 2 feet above the high water of 1882 prior to November 1, 1884, and, furthermore, provided that the district officer upon examination of such levee shall find its condition to be such as to require such repair for its safety.

A personal examination by the district officer was made in September and the need of its repair determined. The local levee authorities have made a contract for the work from Helena to Long Lake, to be done by October 31. It is expected, therefore, this $15,000 will be expended as above.

Respectfully submitted.

CLINTON B. SEARS,
Captain of Engineers, U. S. A.

UNITED STATES ENGINEER OFFICE,
Memphis, Tenn., October 10, 1884.

CAPTAIN: I have the honor to submit a report of the improvement of Memphis Reach and Harbor from November 1, 1883, to October 1, 1884. The work comprises the protection of the banks in Hopefield Bend and in Memphis Harbor.

HOPEFIELD BEND.

The original project was to begin at Mound City Chute, and revet the bank for a distance of 2 miles, towards Hopefield, Ark., leaving the lower portion of the bend unprotected so as to allow the river to straighten itself by cutting away the point at Hopefield, which would decrease the pressure now exerted against the Memphis Front. The revetment to consist of brush mattress work, covered with stone, extending from the bed of the river to the top of the bank. This work was begun in December, 1882, and up to November 1, 1883, 6,700 linear feet of lower bank had been revetted, and 4,100 linear feet of this had been extended to or near the top of the bank. At the close of the working season of 1882–'83 (January 4, 1883), 10,400 linear feet of the below-water bank had been revetted, and 5,700 linear feet of upper bank work completed. The deep-water mattresses were 140 feet wide, built and sunk in lengths of about 1,000 feet. The upper bank revetment consisted of two layers of brush, secured with poles and wires, and were covered with stone—this was to be placed upon a slope of 1 on 3, graded by the hydraulic process, and to extend to the top of the bank, but, owing to lack of sufficient grading power, the slope was in most places greater, and not extended to the top of the bank. In many places it was 1 on 2 or 2½ feet, ending against a hard stratum of buckshot earth, 6 to 10 feet below the top of the bank. Two grading machines were used, the one a Dayton cam pump, described in my report of last year, which has a steam cylinder of 16½ inches diameter, water cylinder 9 inches diameter and 18-inch stroke, discharging 325 gallons per minute at 140 pounds pressure, and removing about 60 cubic yards of earth per hour. The other was a pile-driver pump (Knowles duplex), having 10-inch steam cylinders, 6-inch water plungers, 12-inch stroke, discharging about 200 gallons per minute at 160 pounds pressure. As the pump worked but a short time and in hard material the quantity cut per hour was only 16 cubic yards.

During the low water of 1883 it was decided to build the deep-water mattresses continuously, but the river began rising in November, piling drift against the moving barge and mat to such an extent that, on November 14, I was obliged to sink it, after 2,571 linear feet had been made.

On November 30 a mat 1,057 by 140 feet was lost while attempting to sink. Nine lines, varying in diameter from 1½ to 2 inches, were parted, due to the great strain brought upon them by drift which had accumulated in considerable quantity above the mooring barge and under the head of the mattress. Work, however, was still continued; more and larger lines were placed both to the mooring barge and to the head of the mattress.

Two mattresses were sunk after this, when work was suspended in the lower portion of the bend, and the ways moved to near Mound City Chute to repair the damage caused by a large cave, which occurred on December 12, breaking up the revetment placed during the season of 1882 and 1883, for a length of about 500 feet, and width

in the middle of 175 feet. The large deep-water mattress broke in small sections and was carried away. When this mattress was sunk it reached practically to the foot of the slope.

An examination, made after the caving, showed that the depth along its outer edge had increased from 40 to 75–80 feet. This increased depth was undonbtedly due to the caving away of the bank above, where new revetment had been done, leaving the revetted point projecting in the river; an additional cause may have been that our fleet of boats had been lying for some time at this place. Several smaller caves occurred in the upper bank later, all being where boats were lying along the bank or above mooring barges where drift had accumulated. After the boats were removed no caving occurred along this portion of the bank. The river continuing to rise, all work was suspended on January 23, 1884.

At this date there was needed to complete the work laid out for the season 1,000 linear feet of deep-water mattress, in lower portion of bend; 800 linear feet to cover space at mouth of Mound City Chute and the banks just below, and 5,600 linear feet of upper bank revetment from 60 to 75 feet wide. Over one-half of the work done during the season of 1882–'83 had disappeared, although it had successfully withstood the high water of 1883.

An examination, made after the subsidence of the high water of this year, showed a considerable amount of caving in the lower part of the bend, commencing at the end of the upper bank revetment and extending to Hopefield, where the sites of 10 buildings were washed away. Wherever the revetment had been carried to or near the top of the bank very little caving had taken place, only a few minor breaks having occurred in the upper revetment, all of which have been readily repaired. Five thousand seven hundred linear feet of revetment withstood the high water of 1884.

Along that portion of the bank where no shore-work was placed, the bank caved, the widths of caving varying from 200 feet near the middle of the bend to 700 feet near Hopefield.

This destroyed 4,500 linear feet of deep-water revetment; add to this 500 linear feet lost in December 18, 1883, the total is 5,000 linear feet of revetment lost or nearly 50 per cent., but the greater portion of this was incomplete work, not being extended above the low-water line.

The conclusion drawn is that if the revetment had been completed it would have successfully stood the high water of the spring of 1884. The project for this season's work is, first, to repair and strengthen the revetment that held, extending the same nearer to the top of the bank where practicable; second, to replace the deep-water mattresses in the lower part of the bend, lost last season, for a distance of 5,000 linear feet; third, place a mattress across the mouth of Mound City Chute, extending the same to cover the break below, a total length of 800 feet. The revetment in all cases to be extended to the top of the bank, which will first be graded to a slope of 1 on 3.

Some modifications have been made in the former method of construction, viz, the width of deep-water mattresses has been increased to 150 feet, and the shore-edge is held against a line of piling driven 8 feet apart, and on a line about 5 feet below low water; this will increase the width of the revetment from 25 to 30 feet. The mattresses are being made thicker and stronger by weaving brush around but 2 poles, instead of under and over for the whole length of the brush, then throwing the tops on the mattress. These tops are secured by a binding pole well wired to the weaving poles, and transverse poles are placed over the binding poles, spaced 8 feet apart.

In addition 5 one-half inch iron rods and 2 five-eighth inch wire ropes are run through the mats longitudinally, and one-half inch iron rods or wire ropes are run through transversely every 40 feet, the ends of the latter being secured to piling or to the shore; all rods and wire ropes are well secured to the mattress at numerous points with wires.

The construction of shore work is about the same as last year, except that considerable wire rope is used and a much greater quantity of stone.

The shore work will extend outside of the line of piling and lap the deep-water mattress about 20 feet; it will be double the thickness of the latter. Work was begun on August 14, 1884, with one screen barge for building foot-mats, one pile-driver, and one grader-boat. On September 12 the work of building deep-water mattresses was begun; good progress has been made, and it is expected that with favorable conditions of the river the projected work will be completed by December 1, 1884.

The work done for the eleven months ending October 1, 1884, is as follows:

Deep-water mattress made:		
5,539 by 140 feet 1,278 by 150 feet	..squares..	9,671
Deep-water mattress sunk:		
4,895 by 140 feet 1,115 by 150 feet	....do....	8,525

Deep-water mattress lost in sinking, 1,260 by 140 feet	squares..	1,764
Shore protection completed	do....	4,466
Earth removed by hydraulic grader	cubic yards..	30,451
Earth removed by hand grading	do....	3,288
Number of piles driven		338

(See annexed tables for cost of work, material used, &c.)

MEMPHIS HARBOR.

The project for the protection of the harbor is to revet the banks in a manner similar to the work at Hopefield Bend, commencing at about 1,000 feet above the mouth of Wolf River, and extending the same to the end of the paved levee at the foot of Beale street.

Owing to the depths of water, mattresses were to be constructed 200 to 300 feet wide, in order to reach the foot of the slope.

During the high water of last spring the bank caved at a number of places along the city front. This caving continued until the river reached its lowest stage, in August, 1884.

The locations are as follows: From the mouth of Wolf River to foot of Market street, a distance of 1,200 feet, the average caving is 85 feet, being 140 feet a short distance below Wolf River, 90 feet at middle of Memphis Compress Company's shed, 70 feet at foot of Winchester street, and 25 feet at foot of Market street.

A portion of the Compress Company's buildings were removed or caved in the river, viz, a cotton shed 178 by 48 feet, and platform 245 by 50 feet.

The Ponola Oil Mill Company lost part of their buildings, viz, frame portion 140 by 45 feet, and brick portion containing their elevating machinery, 50 by 45 feet. Between the south side of market street and the Memphis Grain and Package Company's elevator no caving occurred. At the lower side of the elevator the caving was 300 feet long by 30 to 50 feet back, destroying a portion of the building, 226 by 96 feet, which contained three steam legs or inclines used in loading and unloading steamboats, and caused the company to discontinue their large river business.

At the Hanover oil mills a piece 150 feet long by 25 feet deep caved; this extended back to the foundation walls of the mill, threatening to undermine them. For their protection two large loads of stone, containing 479 cubic yards, were given by the Government to the mill company and placed on the caving bank during the early part of June. This appears to have arrested the caving.

At the foot of Jefferson street a piece of the paved levee, 130 by 75 feet, caved in. This was a top-bank cave, the piling below not being disturbed, and was probably caused by the whirls and eddies caused by a sunken barge just above.

No other caving took place along the levees except a slight settling of the lower portion for a length of about 300 feet, between Jefferson and Court streets. Along the high bluff below the levee, caving took place at a number of places, only two, however, being of any extent. The first, between Linden and Pontotoc streets, was 175 feet long by 35 feet back; the second, south of Vance street to the De Soto oil mill, was 375 feet long by 113 feet back; this carried away the end of a large ice-house and a corner of the De Soto oil mills.

All the above is along the city's water-front, where valuable business properties are located. Work was begun July 29, by placing mooring-barges in position about 500 feet below the mouth of Wolf River. These were made from two coal shells and placed end to end, the total length being 350 feet. Two mattress ways, each 160 feet long, were placed end to end below, and a mat of the usual construction, 144 feet wide, built on each; the space between of 12 feet was to be covered with brush poles and iron tie-rods, these making the mattress 300 feet wide. After building this 289 feet long, the drift had accumulated under the outer barge and mattress to such an extent that the first attempt to sink with mats was abandoned and the outer mat dropped below the inner.

On August 12, the construction of a mattress 300 feet wide was begun; great care was taken in its construction and also in mooring it to the shore.

Two five-eighths inch iron rods, ten one-half inch iron rods, and three five-eighths inch wire ropes were run through it longitudinally. It was held to the mooring barge by 1-inch and 1¼-inch slip lines at every 16 feet across the head. Seven shackle lines from 1½ to 2 inches diameter ran from the head to the shore, whilst the mooring barge was held in place by nine lines of from 1½ to 2½ inches diameter, all the lines having long leads. In addition the mattress was fastened to shore by diagonal lines running across it at about every 100 feet in length.

After completing 690 lineal feet, an attempt was made to sink. The entire mat was well ballasted and the head sunk to the bottom, when it broke straight across a short distance below the middle. The lower portion swinging around, was checked and sunk in front of the elevator. Another mattress 250 feet wide was immediately begun, additional strength being added in the shape of iron rods and cables; this also

broke when being sunk, parting the iron rods and wire rope; about half of it was secured and sunk in front of the elevator. Immediately after this second failure two mattress ways were started to build mattresses 150 feet wide, the intention being to place wider mattresses on top of these as soon as material for their construction could be obtained, the fact being recognized that in this deep water and strong current mattresses must be constructed much stronger than even heretofore.

It is proposed to build the next mattress during low water, to make it 500 feet long and 250 feet wide, to bind to it longitudinally 12 three-fourths inch iron chains, 8 five-eighths inch iron chains, 3 2-inch manila ropes, 2 one-half inch sisal ropes, and transversely every 40 feet apart to place across the mat chains of one-half inch iron, all the iron chains to be made in links of 16 feet, well twisted together. Additional and heavier mooring shackles and diagonal lines will also be attached to the mattress.

On the 30th September the bank was revetted with mattresses 150 feet wide, from 500 feet above the mouth of Wolf River to 150 feet above Jefferson street, a length of 3,925 feet. This revetment is doubled for a length of 960 feet between Winchester and Exchange streets, while in front of the elevator there are three thicknesses of mattresses.

The work done for the eleven months September 30, 1884, is as follows:

Deep-water mattress made:		
761 by 144 feet 690 by 300 feet 479 by 250 feet 3,442 by 150 feet	squares	9,526
Deep-water mattress sunk:		
761 by 144 feet 365 by 300 feet 300 by 100 feet 240 by 250 feet 3,158 by 150 feet	do	7,828
Deep-water mattresses lost in sinking:		
225 by 300 feet 239 by 250 feet	do	1,729
Earth removed by hydraulic grader	cubic yards	2,870
Earth removed by hand grading	do	3,620
Shore protection completed	squares	799
Number piles driven		16

(See annexed tables for cost of work, materials used, &c.)

PLANT.

The following is a list of the plant on the reach: 1 tow-boat, 5 quarter-boats, 4 mattress-boats (2 belonging to Lake Providence reach), 4 screen-boats, 1 machine-shop boat, 1 hydraulic grader, 4 mooring barges, 22 decked barges, 9 pile-drivers, 1 bakery-boat, 2 coal-shells, and 5 small flat-boats.

Estimated value, exclusive of two Lake Providence mattress-boats, $118,000.

All the above is in serviceable condition. Upper cabins were added to two of the quarter-boats, thus nearly doubling their capacity. I have now accommodations for 500 laborers.

Our hydraulic grader was found too light to carry heavy pressure, so two pile-driver pumps were placed on one driver and connected. The old grader delivers the water to this pair of pumps at a pressure of 100 pounds. The result is that the work done is nearly double what both machines would do singly at 140 pounds' pressure.

Improvements were made to mattress-boats by placing platforms on each end, thus increasing the length by 12 feet and adding two more runs, so that mattresses are now built 150 feet wide instead of 140 as heretofore.

Two mooring barges were built from coal shells and two from coal barges. All are well strengthened with iron tie-rods and well supported with bitts, cavils, checks, &c.

A bakery-boat was fitted up with two large, wrought-iron ranges. Two small barges were built for distributing supplies; a tug was chartered by the day to do the work on the reach. The steam launch Daphne exploded her boiler on August 21, killing three men.

SURVEYS.

A survey party was organized in June, and triangulated the reach from Island No. 40 to the head of Vice-President's Island. The bank and bar lines have been located and compared with surveys of former years. Forty-six ranges were established and sounded. Soundings were repeated every ten days on ranges where revetment had been placed, to determine if possible if any changes took place in depth of channel due to revetment.

These soundings were also compared with those taken in 1882 and 1883. From the data collected it is impossible to determine whether or not the channel deepens along the revetted bank.

The banks had caved at a number of places. Above the mouth of Wolf River, the caving extended 2,700 feet as follows; (1) 1,000 feet, 80 feet back; (2) 1,000 feet, 100 feet back; above, 30 feet back; area covered, 4½ acres.

Just below mouth of Wolf River, bank has caved 600 feet since 1867, 250 feet since 1877, 140 feet during past year. Area covered between mouth of river and foot of Market street, 2½ acres.

The length of the caving on Hopefield Bend was 8,750 feet; average width, 400 feet; area about 80 acres.

Near Mound City Chute the length caved is 3,500 feet; width average 50 feet; area, 4 acres. Very little caving occurred above Old Hen Island, although for several years back there was considerable there.

The sand-bar opposite Memphis has increased in size, covering the river very much during low stage. Comparing the surveys of 1882 and 1884, both taken at the 11.4 stage, the encroachment of the bar towards Memphis side, is 750 feet. The width of river at foot of Jefferson street at 11.4 stage was 1,650 feet in 1883, and 1,300 feet in 1884.

The bar opposite Hopefield Bend moved down 300 feet since October 1883, the width of river at 11.4 stage being 1,590 feet.

Total revetment completed November 1, 1883, *to September* 30, 1884.

	Squares.
Hopefield Bend	12,991
Memphis Harbor	8,627
Total	21,618

Cost of above (not including plant and equipment).

Survey	$2,030 06
General service, coaling steamers	502 28
General expense, office and fleet	19,306 28
Tow-boat service	15,415 61
Construction and repairs to plant and machinery	14,623 27
Revetment:	
Hopefield Bend	56,198 10
Memphis Harbor	39,094 12
	147,169 72
Cost of revetment per square of 100 feet	6 80
Cost of revetment per linear feet of bank for mattress 150 feet wide and shore work 100 feet, on slope of 1 on 3 (approximate)	17 00

Very respectfully, your obedient servant,

W. M. REES,
United States Assistant Engineer.

Capt. C. B. SEARS,
Corps of Engineers, U. S. A.

APPENDIX H.

REPORT OF CAPTAIN CLINTON B. SEARS, CORPS OF ENGINEERS, UPON OPERATIONS IN THE THIRD DISTRICT.

(Capt. W. L. Marshall, Corps of Engineers, U. S. A., in charge to April 21, 1884; C. B. Sears, Corps of Engineers, U. S. A., in charge since April 21, 1884.)

I.—LAKE PROVIDENCE REACH.

The extent of this reach, its physical characteristics, and the general project for its improvement, were fully set forth in the last annual report of Capt. W. L. Marshall, Corps of Engineers, and published in the Commission's Report for 1883. The work of the year has been a continuation of the work previously started, and has been carried on by similar means and with the organization then obtaining.

(1.) *Duncansby to Stack Island.*

Assistant Engineer Arthur Hider, in immediate local charge, assisted by Assistant Engineer Childs, in charge of mattress and revetment work; Assistant Engineers Ruple and Tollinger, in charge of dike work; and Assistant Engineer Thompson, in charge of surveys and observations.

DUNCANSBY SYSTEM.

The additional dike on Range 36, under way at last report, has been finished, and some repairs have been made in the main dike near the head, joining the outer ends of Cross-dikes 6 and 7, and gaps in these cross-dikes have been closed.

The channel continues to encroach upon the dikes at the upper end, and will probably continue to do so until the revetment of Pilcher's Point Bend shall have been completed. No further work is recommended here, except such repairs as circumstances may dictate from time to time, to avert the river going down through Skip-with Chute, should such danger threaten.

MAYERSVILLE SYSTEM.

Cottonwood dikes.—This is new work, and has been constructed during the past season. It is shown on the progress sketch. Its object is to contract the channel way, regularize the channel, and hold it in the bend of Mayersville Island (No. 93).

A new feature in these dikes is a parallel interior longitudinal dike in addition to the usual cross-dikes. Their construction has resulted in a considerable fill below and behind them, thus building up the bar and keeping the channel on the other side. The whole of the work is in good condition, and is the most compact and symmetrical piece of dike-work on the reach.

DIKES IN MAYERSVILLE CHUTE.

The object of the work here is to close the chute behind Mayersville Island (No. 93). The five-row cross-dike finished last fall stood through the flood of 1884 until April 21, when a gap some 125 feet in width took place. This gap has since been closed.

The channel is encroaching on the head of these dikes, and has carried away all but 600 feet of the longitudinal dike. This will result in no material injuries to the system if the chute can be closed and the head of the island held. It is proposed to bring this about by more cross-dikes below the present one, and by extra mattressing round the head of the island.

REVETMENT OF MAYERSVILLE ISLAND.

The work here has consisted in the repair, extension, and strengthening of the work of last year. The island is all sand, and the current along its front is strong.

Most of the revetment has stood reasonably well, considering these facts. Whether the head of the island will hold against the encroachments of the main channel is problematical. If it do it will be a satisfactory test of the efficacy of this mode of revetment, though at best it will always need watching and immediate and frequent repairs. In this connection attention is called to Assistant Engineer Childs's sub-report, marked Appendix H 3.

BALESHED SYSTEM.

The laying of foot-mats at the head of the system was finished last winter before high water.

During the season just past a high-water dike has been built in rear of the main (low-water) dike from Cross-dike 1 to 4, and extended down outside of main dike to Cross-dike 6.

A cross-dike from the Mississippi shore to the main dike at a point about 2,000 feet above Stack Island has been built, and the main dike from this point to the island has been re-enforced by an interior longitudinal dike.

In addition some repairs have been made in Cross-dikes 3 and 4 and the main dike between Cross-dikes 5 and 6 has been strengthened by sinking condemned barges in front.

The Baleshed system shuts off a long, continuous line of chute. The head of the system is now essentially dry at half stage. The first depression occurs at Cross-dike No. 5. From here to the foot of Stack Island is 4¼ miles, representing a fall of about 16 inches; that is, were the pool behind the dike at No. 5 at the same level as at the foot of Stack Island, the water pushing through the dike would have a straight drop of 16 inches.

The steep slope of the water surface gives high velocity, and this has caused trouble at this point. It is proposed to break up this fall by two or more cross-dikes, thus making a series of pools. For further details, see reports of Assistant Engineers Hider, Childs, Ruple, Tollinger, Thompson, and Steubing, herewith, marked Appendices H, H 3, H 4, H 5, H 6, H 8.

(2.) *Pilcher's Point (Louisiana) Bend.*

Assistant Engineer J. E. Turtle in local charge, assisted by Assistant Engineer H. Steubing.

The work of upper and lower bank revetment in this bend has been pushed rapidly since the fall of the water, and there is every prospect of finishing the greater portion before the next rise. The lower bank revetment at the upper end, put in last November and December, was found to be in good shape this season, and no caving took place.

The part revetted at the middle of the bend, as might be expected, was flanked from above and caving took place behind it. As far as can be ascertained by a diver, this revetment is intact and lying on the bottom of the river in the same vertical prism of projection as first placed. It has simply assumed a horizontal position. Efforts will be made to lap on to this with the new work. It is a reasonable supposition that had this mat been protected at the upper end, and the upper bank been revetted, the caving would not have occurred.

For further details of this work, see the report of Assistant Engineer Turtle herewith, marked Appendix H 2. The map herewith, marked Appendix H, Plate VII, will show the progress of the work.

FINANCIAL STATEMENT.

Lake Providence Reach.

Balance available November 1, 1883	$156,327 93
Additional allotment from unallotted reserve	67,200 00
Amount transferred from Vicksburg Harbor allotment	42,295 00
Amount allotted from appropriation of January 19, 1884	400,000 00
Amount allotted from appropriation of July 5, 1884	300,000 00
	965,822 93
Expended from November 1, 1883, to September 30, 1884:	
Services	223,366 21
Material and supplies	213,807 18
Subsistence	50,430 20
Plant, tools, and repairs of same	65,269 00
Charter of steamers, barges, &c	9,305 00
Fuel	28,623 80
Miscellaneous	25,223 88
General service	18,711 41
Total expended	634,736 68
Transferred to levees, Yazoo and Tensas fronts, $10,000 each	20,000 00
Transferred to levees, fourth district	27,000 00
Transferred to levees, general service	10,000 00
Amount paid R. Moore on account of dredging in Vicksburg Harbor	10,593 58
	702,330 26
Balance available October 1, 1884	263,492 67
Balance in Treasury	200,000 00
Balance in hands of Captain Sears	63,492 67
	263,492 67

(3.) *Summary.*

The original condition of the channel-way along the Lake Providence Reach was bad, the channel being flat, badly defined, and often with only 5 feet of water.

The original project for improvement was the narrowing of the water to 3,000 feet by closing the chutes and creating artificial banks through deposition, and the preservation of the natural curves of the river by revetting the caving banks.

No important amendments, alterations, or additions have been made in the general plan. Some details of construction have been changed from time to time as experience demanded.

The total amount expended to November 1, 1883, was $1,228,916.47. At that date the availability for the purposes of navigation and commerce of the channel had been greatly improved, there being throughout the reach a depth not less than 12 feet, with a fair navigable width.

During the eleven months from November 1, 1883, to October 1, 1884, there have been expended $634,736.68, and the channel-way has shown a betterment in the regularity of outline, in width and depth, there having been no water less than 15 feet along the channel-way, though less depths have been reported by commercial steamers; they were, however, not in the deepest portion of the channel, either through accident or by reason of there being sufficient water for the boats on the line traversed, hence no need to follow the line of deepest water.

There has been throughout the low-water season, to date, a deeper channel by from 6 to 7 feet than has obtained on the river for 40 miles above the Lake Providence Reach.

The works generally have stood the last flood very fairly, the damages that have occurred having been due to local causes.

No extended caving has occurred as yet where the bank revetment has been completed in good shape.

During the year ending October 1, 1885, $400,000 can be profitably expended towards carrying out the project for the improvement of this reach. With this it is proposed to revet some 25,500 linear feet of bank, at four places, viz:

	Feet.
Miss. R. 30 to R. 34	7,500
Miss. R. 44½ to R. 49	9,000
La. R. 72 to R. 74	3,500
La. R. 86 to R. 89	5,500
Total	25,500

To build in Mayersville and Baleshed chutes 3,000 linear feet of dike, to wattle dikes already constructed, to repair existing dikes and revetment, to repair plant, and to pay for transportation, administration, and surveys.

The advantages and benefits to be expected therefrom are the continuation of the project adopted by the Commission, and the maintenance of the present good low-water channel.

An estimate for the entire and permanent completion of the work of improvement on this reach I am unable to give, not knowing the intentions of the Commission as to the ultimate extent of the work.

As this work is only one link in the chain of general improvement of the river, the amount of commerce and navigation that will be benefited is that incident to the whole river, a statement of which has already appeared in the previous reports of the Commission.

The present estimated value of the plant, tools, and outfit on hand, belonging to the reach, is $300,000.

II.—Vicksburg Harbor.

(Assistant Engineer H. St. L. Coppée, in local charge.)

The work here consists of the improvement of the harbor proper and the maintenance of Delta Point, in Louisiana, opposite Vicksburg.

The former is entirely local in character, and would add nothing to the general improvement of the river.

No funds were allotted from the last two appropriations, and no work has been done except a survey in June, 1884. This showed a tendency of the channel above the town of Vicksburg to cut into the bar across the mouth of Centennial Lake, and that the basin partly dredged in 1883 has remained practically unchanged.

DELTA POINT, LOUISIANA.

The holding of this point is deemed essential to prevent further recession of the river from Vicksburg and to maintain the regimen of the river immediately below. The point has been held by brush and stone revetment against a fierce current for two years, but at great expense for repairs and enlargement. There is no reason to suppose that extensive repairs will not be necessary annually unless the river, due to changes in the curvature above, changes over so as to leave this point in slackwater.

In January last an attempt was made to repair the revetment, but work was stopped by a rapidly-rising river before much had been done.

Early in August, with plant borrowed from the Lake Providence Reach, work was resumed and pushed as vigorously as the climate and class of labor available would permit. It consisted of extensive repairs to the upper and lower bank revetment at the upper end, and of a continuation of the same at the lower end. It was finished October 10, 1884, and the plant returned to the Lake Providence Reach. For further details attention is called to the report of Assistant Engineer Coppee, herewith, and two drawings, marked Appendix H 9, Plates X, XI, respectively.

The total expenditure on Vicksburg Harbor under the Commission, to date, has been $147,754.44, and of this about $100,000 has been expended on Delta Point. Previous to the Commission taking charge, $203,229.87 had been expended on Delta Point.

If the revetment holds all right during the coming year no money will be needed for this improvement, but as it is probable that weak places will develop, it is thought that it will be advisable to have $10,000 available for possible repairs.

FINANCIAL STATEMENT.

Vicksburg Harbor.

Balance available November 1, 1883		$55,477 60
Balance available from Delta Point allotment		7 64
Amount allotted from appropriations of July 5, 1884		25,000 00
Total		80,485 24
Expended from November 1, 1883, to September 30, 1884:		
Services	$12,746 47	
Material and supplies	5,770 18	
Subsistence	2,439 10	
Plant, tools, and repairs of same	299 38	
Charter of steamers, barges, &c	645 19	
Fuel	829 10	
Dredging (retained percentage)	4,235 41	
Miscellaneous	504 72	
Total expended	27,469 55	
Transferred to Lake Providence Reach allotment	42,295 00	
		69,764 55
Balance available October 1, 1884		10,720 69
Balance in hands of Captain Sears		10,720 69

LEVEES.

The unfinished contracts for levees on Yazoo Front were completed in December, 1883. During the last flood none of the levees on this front built or repaired by the United States gave way, but they were only held by the energetic exertions of Captain Marshall, aided by the local inhabitants. About $11,000 were expended in protecting them with planks and sand-bags, and in raising them in the face of the flood. About 23,000 sacks and 10,000 feet of lumber were used.

The same exertions on the Tensas Front saved many miles of levee, but were not so entirely successful in averting breaks. A number of breaks took place from Delta to Bedford, one break at Raleigh, and considerable damage from wave wash. The amount expended for protection on this front was about $18,000. Over 47,000 sacks and 231,000 feet of lumber were used.

The Commission at its last meeting made an allotment of $160,000 for the general repair of United States levees in the second, third, and fourth districts, to be divided by the United States Board of District Officers. Besides this, it allotted $25,000 for the levee from Arkansas City to Amos Bayou, provided sufficient means should be guaranteed by the local authorities to complete this levee. Up to date this guarantee has not been given.

The United States Board of District Officers allotted of the $160,000, $90,000 to the Tensas Front, fourth district, $50,000 to the Tensas Front, third district, and $20,000 to the repair of levees on the Yazoo Front, second district, providing the local levee board, on or before September 10, guaranteed to expend $500,000; in default of this, the $20,000 was to go to the repair of levees on the Yazoo Front, third district.

This guarantee not having been given by September 10, this sum reverted as indicated, and steps were taken in the latter part of September to provide for its expenditure.

September 5, advertisements for repairing gaps at Raleigh and Delta, La., were published. The bids were opened September 15, and the contract for both pieces was

awarded to George Arnold, the lowest of fifteen bidders, at 17⅝ cents per cubic yard for the Raleigh work, and 18⅝ cents per cubic yard for the Delta work. Work was begun immediately and is now progressing.

FINANCIAL STATEMENT.

Levees—Yazoo Front.

Balance available November 1, 1883		$20,213 68
Transferred from allotment for protection of cut-off at Tarpley's Neck		3,000 00
Transferred from Lake Providence Reach		10,000 00
Allotted appropriation of July 5, 1884		20,000 00
Total		53,213 68
Expended from November 1, 1883, to September 30, 1884:		
Services	$3,278 53	
Labor and material, protection of levees	12,199 75	
Subsistence	41 84	
Plant, tools, &c	17 00	
Contractors, estimates	13,633 21	
Miscellaneous	449 10	
		29,619 43
Balance available October 1, 1884		23,594 25
In Treasury		20,000 00
In hands of Captain Sears		3,594 25
Total		23,594 25

Leveees—Tensas Front.

Balance available November 1, 1883		$57,683 51
Amount allotted, appropriation of July 19, 1884		10,000 00
Amount transferred from Lake Providence Reach allotment		10,000 00
Amount allotted, appropriation of July 5, 1884		50,000 00
Amount deposited by Captain Marshall on account of error in his accounts		1 50
Total		127,685 01
Expended from November 1, 1883, to September 20, 1884:		
Services	$5,383 42	
Labor and material, protection of levees	16,935 35	
Subsistence	161 50	
Plant, tools, &c	74 60	
Contractor, estimates	47,358 47	
Miscellaneous	585 20	
		70,498 54
Balance available October 1, 1884		57,186 47
In Treasury		50,000 00
In hands of Captain Sears		7,186 47
Total		57,186 47

The following drawings accompany this report:

LAKE PROVIDENCE REACH.

One map showing velocity and discharge-section curves, marked Appendix H, Plate III.

One tracing showing changes in discharge section, marked Appendix H, Plate IV.

Three tracings, Plates VII, VIII, IX, showing condition of works October 1, 1884, marked Appendix H.

One tracing of comparative sections, Pilcher's Point, marked Appendix H, Plate VI.

One tracing of comparative sections in chutes, marked Appendix H, Plate V.

One tracing July quarterly survey, $\frac{1}{60000}$ scale, marked Appendix H, Plate I.

One map discharge curves, area, velocity, and discharge, marked Appendix H, Plate II.

VICKSBURG HARBOR.

One tracing showing Vicksburg Harbor and Delta Point, marked Appendix H, Plate X.

One tracing showing details of work at Delta Point, marked Appendix H, Plate XI.

Respectfully submitted.

CLINTON B. SEARS,
Captain Engineers, U. S. A.

H 1.

REPORT OF ARTHUR HIDER, ASSISTANT ENGINEER, UPON OPERATIONS LAKE PROVIDENCE CONSTRUCTION PARTY.

WILSON'S POINT, LA., *October* 1, 1884.

SIR: The following report of the operations of the Lake Providence construction party, from November 1, 1883, to October 1, 1884 (eleven months), is respectfully submitted:

The portion of the river known as the Lake Providence Reach extends from Carolina to Hays' Landing, Miss., a distance of about 35 miles. The crossings on the lower portion of the reach, between Island 93 and Island 95, have heretofore been troublesome, on account of shallow water, during the low stages of the river; in fact, this part of the reach of late years has been considered, at low water, the shoalest part of the river between Plum Point and New Orleans.

The depths on some of the crossings, in former years, have been not more than 5 feet, with a very narrow channel, rendering navigation for boats of large size impracticable during the low-water period.

The original project for the improvement was, the contraction of the river at excessively wide places, the revetting of caving banks, and closing the island chutes.

The work now in progress and that which has been completed has been revetting the Louisiana Bend and the front of Mayersville Island with mattresses; closing the Duncansby, Mayersville, Baleshed, and Stack Island chutes by a system of dikes; and the construction of a system of dikes on Cottonwood Bar, to contract the width of the river at that point.

The effect of the work that has been finished is shown in an increased depth of water on all crossings which were heretofore shoal during the low stages of the river.

The least depth of water found at any point in a channel 1,000 feet wide, from Elton to Stack Island, was, August 30, 10 feet; this increased to 14 feet September 9, and September 30 the depth was 15 feet. Below is given the least depths found in a channel 1,000 feet wide, on the Stack Island Crossing; also the least depths on the crossing from Ben Lomond to △ Wiley, with dates and gauge-readings at Lake Providence. There has been at all times a channel for steamboats on the Stack Island Crossing as usually run by them of at least 15 feet in depth. The depths as given in the table are the *least* depths found in a channel 1,000 feet wide on the crossing.

Shallow Crossings, Lake Providence Reach.

Date.	Lake Providence gauge-reading.	Stack Island, 1,000-foot channel. Least depth.	Ben Lomond, 1,000-foot channel. Least depth.
1884.		*Feet.*	*Feet.*
August 9	15.5	18	24
August 19	12.6	14	12
August 30	8.9	10	14
September 9	9.1	14	17
September 19	6.6	17	11
September 30	5.8	15	11

Ben Lomond Crossing is about 3 miles below the head of Stack Island. The lowest point where improvement works have been constructed is at the head of Stack Island. During the present low-water season there has been no difficulty experienced by steamboats in navigating any part of the reach.

For the same period covered by the soundings as given above, the least depths in steamboat channel on the Sterling Crossing, 4 miles, and Leland, 35 miles above Carolina Landing (the beginning of Lake Providence Reach) were as follows:

Crossings above Lake Providence Reach.

Date.	Lake Providence gauge-reading.	Sterling (4 miles above reach).	Leland (35 miles above reach).
1884.		*Feet.*	*Feet.*
August 8	15.5	8	9
August 20	12.0	8½	8½
September 1	8.5	9	8½
September 11	9.3	9	8
September 13	8.9	9	8
September 27	5.7	9	7

This shows a marked improvement in the channel depths on the reach, at the shoal places, compared with that found in the river immediately above.

The amount expended for labor on the improvement from Duncansby to Stack Island is given below in the following statement:

Cost of labor and subsistence.

	Pay-roll.	Subsistence.	Total.
Mattress construction and bank protection	$44,915 09	$10,956 93	$55,872 02
Dike construction	40,673 63	9,993 66	50,667 29
Surveys	10,347 15	2,006 54	12,353 69
Tow-boat service	19,951 84	3,379 59	23,331 43
Construction and repairs to plant, &c	34,579 15	4,813 72	39,392 87
Care of property	6,914 14	2,215 17	9,129 31
Total	157,381 00	33,365 61	190,746 61

The average cost of a ration, including ice, in the warm months, has been—

	Cents.
Cost of raw material	29.6
Cost of ration served	37.3
Cost of ration for each day's labor secured	43.3

The maximum number of men employed in any one month has been 716; the minimum, 111.

During the next year the following amount, to continue the improvement as laid out in the original project, can be profitably expended in revetting caving banks and in dike constructions:

Bank protection to prevent caving.

	Linear feet.
From R. 30 to R. 34, Mississippi	7,500
From R. 44½ to R. 49, Mississippi	9,000
From R. 72 to R. 74, Louisiana	3,500
From R. 86 to R. 89, Louisiana	5,500
Total	25,500
25,500 linear feet, at $10.12	$258,060

Pile dikes, Mayersville and Baleshed chutes:	
3,000 linear feet, at $7.25	$21,750
Wattling dikes already constructed at Baleshed and Stack Island	5,000
Repairs to dikes and revetment	15,000
Tow-boat service	25,000
Repairs to plant	40,000
Care of property	10,000
Contingencies	5,190
Total amount that can be profitably expended	380,000

The construction of mattresses and revetting of caving banks has been under the direction of Assistant Engineer William M. Childs, the dike work under Assistant Engineers C. P. Ruple and E. C. Tollinger. Assistant Engineer Henry Steubing had charge of unloading stone and distributing same on revetment of Mayersville Island, and, for a short time, was engaged in foot-mat construction. On August 1 he was transferred to the work at Pilcher's Point.

The surveys made have been under Assistant Engineer E. D. Thompson.

Reports showing in detail the work done by each assistant are transmitted.

At the close of last season the following work was in progress, viz:

The construction of an additional dike at the head of Duncansby system; revetting the face of Mayersville Island; completing foot-mats, &c., at the head of the Baleshed system of dikes.

This work was all completed before the high water, with the exception of a portion of the mattress-work near the lower end of Mayersville Island.

The work done during the present season has been: The construction of the Cottonwood system of dikes; the building of a high-water dike in rear of Baleshed main dike, from Cross-dike 1 to 4, and extending same on outside of main dike to Cross-dike 6; the construction of a cross-dike across Baleshed Chute, above the head of Stack Island, from the Mississippi shore to the Stack Island main dike, and thence to the head of Stack Island; repairing damages to dikes from the flood; building dike from the outer end of Dike 6 to 7, Duncansby system; repairing revetment on Mayersville Island, and covering the upper revetment with additional stone. For location of dike, &c, see sketches 1 and 2 herewith.

EFFECT OF THE LAST FLOOD ON THE CONSTRUCTION WORKS.

The dike-work generally withstood the flood with but comparatively little damage. The principal injury done was to the dikes at the upper end of the old Duncansby Tow-head; the outer ends of the cross-dikes above No. 7 were cut off during the high water; the upper Duncansby Tow-head has entirely disappeared; the steamboat channel is now where the tow-head was the previous season.

This damage is due to the rapid caving of the banks in the Louisiana Bend forcing the main channel of the river to the Mississippi side below Pilcher's Point. The channel is now along this shore to the head of the Duncansby Dikes, at which point it again crosses back to the Louisiana side.

The current thus forced against these dikes has had the effect of undermining them at their outer ends, and of caving away the tow-head, which was of sand and unprotected. The encroachment of the channel upon the bar at the upper end of the Duncansby Chute will continue until the bend above Pilcher's Point is prevented from further caving by the revetment work now in progress there.

Gaps were broken in Dikes 6, 7, 8 in Duncansby Chute during the high water. The gaps in each of these dikes were about 100 feet in width. The breaks were in the deepest water of the chute.

The low-water dike constructed in 1882, from Wilderness Lagoon to the head of Mayersville Island, was scoured out during the flood, except about 600 feet nearest the Misssissippi shore, which remain intact. This undermining was due to the deep-water channel working in towards the head of the island.

The cross-dike in Mayersville Chute stood during the high water of February, March, and part of April. A gap about 125 feet in width occurred April 21, releasing a part of the large drift accumulation which had lodged in front of the dike. The effect shown immediately afterwards was the washing out of a hole 20 feet in depth through the gap.

The chute is now nearly all dry in the vicinity of the dike, and the effect on the bottom is noticeable immediately at the break, and for about 800 feet below, where a deep hole has been scoured out.

The only assignable reason for the failure of this dike seems to have been from the pressure of drift in front; the drift, not extending to the bottom, caused a scour at the foot of the piles and weakened the dike, which was then unable to withstand the pressure from the front and gave way.

At Baleshed, the only breaks that took place were in Cross-dikes 4 and 5, in which gaps of about 200 feet in width occurred. The upper of these dikes had considerable drift in front of it and is in an exposed situation when the water is over the 20-foot stage, being located immediately below where the low-water and high-water main dikes join.

The above comprises all the damage done to dike-work by the last flood; about 18¾ per cent. of the dike-work constructed previous to November 1, 1883, was washed out.

At Duncansby and Wilderness the dikes gave way by undermining, caused by encroachments of the deep-water channel.

In Duncansby, Mayersville, and Baleshed chutes the breaks were due to drift.

The revetment work on Mayersville Island withstood the effect of the flood, with

the exception of two slides in the revetment near the head of the island, and about 5,210 feet at the lower end, where the bank is low; at this point the river cut behind the revetment, and it caved in.

The damage occurred to the work at the upper end of the island immediately after the flood, while the river was falling rapidly; at the lower end of the island the injury was done during the flood; nearly 27 per cent. of the work done during the season on the island washed out during the high water.

Duncansby Dikes, present condition of the improvements.—The damage to the dikes at the head of the Duncansby system still continues and will, in all probility, not cease until the river at this point adjusts itself to the conditions above, and assumes a more symmetrical shape.

The gaps in the chute in Cross-dikes 6 and 7 have been closed, and a dike driven joining the outer ends of 7 and 8. From present indications it is probable that the river will cut the outer ends of 7 and 8 still further back, as the channel is now working in that direction, and there is a strong current thrown against this part of the work.

Mayersville Dikes.—The gap in Cross-dike 1 has been repaired. This dike will need strengthening to stand the next high water. The deflecting dike built in 1882 at the head of the chute was washed out during the flood.

Cottonwood Dikes.—These dikes are all in good condition.

Baleshed Dikes.—The gap in the main dike, which occurred while the stage of the river was about 10 feet below high water, as well as the gaps in the Cross-dikes 3 and 4, which occurred during the flood, have been repaired; this system of dikes is now in good condition.

Stack Island Dikes.—The dikes here are all intact.

Elton Dikes.—The outer ends of these dikes have been cut off during the flood; but not before they had served the purpose for which they were originally constructed. For location, &c., of dikes, see sketches herewith.

Mayersville Island.—The work from the head of the island to a point 8,300 feet below is in good condition, except about 1,200 feet next to the head, where the mat is broken in a few places next the bank.

Slides in the revetment have taken place; this will require about 1,000 feet of new work from the head of the island down.

METHODS OF CONSTRUCTION.

No material changes in the method of construction have been made during the present season from that in practice heretofore, described in the report of last year's operations.

In the construction of dikes, instead of cottonwood braces, two cypress planks 3 by 8 inches, one fastened on each side of the pile, with an abutting piece mortised into the plank, have been used to a great extent. These are more rapidly put in place, and although the first cost is somewhat greater, it is believed that the saving of time more than compensates for the additional cost, besides giving a better brace.

The use of cypress for the construction of dikes is recommended both for piles and braces; cottonwood will last but two or three seasons, when exposed, while the life of cypress is much greater and will allow of much more satisfactory work being done.

A steam hammer has been tried for driving piles, which gave quite satisfactory results. The leads of the driver upon which it was used have been lengthened, so as to give it further trial. We were able to drive piles from 5 to 8 feet, after the limit of penetration had been reached with the ordinary drivers and with comparatively little battering of the heads.

The practice in mattress construction has been to make them continuons, joining the grillage laid on the slope of the bank with the mattress before sinking, so as to make the construction continuous from the top of the bank to the onter edge of the mattress.

Before sinking, the flotation of the mattress is nearly destroyed by ballasting it with stone distributed over the surface; it is then sunk in position, beginning at the head and retaining the lower end of the mattress on the weaving barge, so that sinking and building mattress can proceed at the same time.

No loss of mattress occurred this season while sinking.

The experience of last year shows that where damage has occurred to mattress-work it has generally been by sliding of the bank. The lower part of the slope just below the low-water line is the point that first gives way, in many instances the mattress tearing apart from the bank revetment proper, leaving a space at the foot of the bank slope exposed without protection to the eroding action of the current.

It would appear that a stronger form of revetment than that afforded by the ordinary brush construction used heretofore will be required to connect the subaqueous mattress with the revetment laid on the slope of the bank in order to insure satisfactory results.

Below is a list of the floating property constituting the plant:

List of boats, barges, pile-drivers, &c., constituting the plant belonging to the reach, of which five small barges, 75 by 15 feet, and one, 65 by 15 feet, were built on the works.

Classification.	No.	Dimensions.	Remarks.
		Feet.	
Tow-boats	5	.....	1 chartered.
Graders	2	110 by 30	
Mattress-boats	4	160 30	
Do	1	140 49	
Screen-boats	4	100 25	
Quarter-boats	10	130 25	
Do	1	100 30	
Do	1	135 30	
Do	2	100 25	
Do	2	80 20	
Do	1	70 18	
Machine-shop boat	1	100 25	
Carpenter-shop boat	1	211 25	
Lumber-boat	1	211 35	
Dock	1	186 50	
Do	1	37 16	
Do	1	25 8	
Wharf-boat	1	186 26	
Derrick-boat	1	100 24	
Pump-boat	1	47 12	Steam.
Barge-decked	1	132 24	Model.
Do	2	160 28	
Do	8	120 26	Flush.
Do	28	100 25	Do.
Do	5	75 15	Do.
Do	1	66 15	Do.
Do	1	60 14	Do.
Pile-drivers	12	70 20	
Do	4	82 20	
Catamaran	1	.....	
Calking flats	8	25 7	
Do	2	42 12	
Yawls	3	.....	
Skiffs	65	.....	
Total	183	.....	

SUMMARY OF WORK COMPLETED AND MATERIAL EXPENDED FROM NOVEMBER 1, 1883, TO OCTOBER 1, 1884.

Work done.

Number of piles driven		9,297
Number of stringers put in place		3,601
Number of braces put in place		6,383
Number of linear feet of dike completed, 2 row		5,463
Number of linear feet of dike completed, 3 row		20,841
Number of linear feet of dike completed, 4 row		861
		27,165
Grillage foot-mat built, 20,594 linear feet	squares..	8,425
Woven foot-mat built, 6,196 linear feet	do....	4,164
Mattress built, 10,928 linear feet	do....	13,786
Revetment built, 15,528 linear feet	do....	8,061
Shore-mat, 2,175 linear feet	do....	836
Wattling, 9,948 linear feet	do....	796
Tilted screens, 2,839 linear feet	do....	1,039
Bank graded, 8,731 linear feet	cubic yards..	71,379
Linear feet pile-dike standing November 1, 1883		44,235
Linear feet pile-dike constructed present season		27,165
		71,400
Deduct old work washed out the present season		8,294
Amount pile-dike October 1, 1884		63,106

On Mayersville Island there is now in fair condition 7,130 linear feet of revetment and mattress work.

Material expended.

Piles	number	9,559
Stringers	do	3,471
Braces	do	6,383
Stone	cubic yards	30,350
Cottonwood poles	cords	1,417
Brush	do	24,737
Wire	pounds	167,000
Iron and spikes	do	178,463
White lead	do	4,515
Oakum	do	5,592
Lumber	feet, B. M.	275,200
Coal	bushels	190,327
Sacks	number	4,600

Very respectfully,

ARTHUR HIDER,
Assistant Engineer in charge.

Capt. CLINTON B. SEARS,
Corps of Engineers, U. S. A.

TABLE 1.—*Hydraulic grading.*

HOPEFIELD BEND.

Ten days ending—	Linear feet.	Cubic yards.	Time worked.	Cubic yards per hour.	Average pressure in pounds per square inch.		Strokes per minute.	Coal.	Composition of material.			Cost per cubic yard.	Cost per linear foot.	Total cost.
					Steam.	Water.			Buckshot.	Clay.	Sand.			
1883.			*Hours.*					*Bush.*	*Pr. ct.*	*Pr. ct.*	*Pr. ct.*	*Cts.*	*Cts.*	
Nov. 10	320	2,230	47	62.9	90	164	88	62	34	50	16	4.9	35	$110 77
20	400	2,375	47	45.8	87	140	84	90	42	40	18	4.9	29	115 70
30	1,320	5,010	57	87.9	84	136	72	130	86	5	9	2.5	10	127 75
Dec. 10*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
20	875	3,945	57	70.4	90	140	71	115	81	13	6	2.2	14	125 74
31	495	2,925	44	61.9	90	140	69	75	82	11	7	3.6	21	105 13
1884.														
Aug. 30	496	4,216	67	62.9	80	125	66	61	.....	60	40	3.0	25	124 44
Sept. 10	335	3,543	87	40.2	80	125	66	50	73	.....	27	3.3	35	116 43
20	332	†3,377	85	39.3	80	125	66	60	54	34	12	3.5	35	117 50
30	397	4,960	58	66.2	80	125	66	42	66	.....	34	2.7	27	106 10
Total ..	4,970	31,581	555	.....	.....	.....	....	685	.....	.....	.....	.....	....	1,049 56
Average.	.....	.....	.....	57	.....	.....	....	.....	.....	.....	.....	3.32	21	.....

*Suspended on account of high water.
†Of this amount 2,780 cubic yards have been graded at Memphis Harbor.

WITH PILE-DRIVER, No. 37, M. R. C.

1883.														
Dec. 20	200	820	45	18	90	155	109	70	86	10	4	8.5	35	$69 9
31	220	830	60	14	90	165	120	45	90	8	2	7.2	27	59 45
Total ..	420	1,650	105	.....	.....	.....	....	115	.....	.....	.....	.....	....	129 39
Average	.....	.....	.....	16	.....	.....	....	.....	.....	.....	.....	7.8	30.4	.....

TABLE 2.—*Record of pile-driver.*

HOPEFIELD BEND.

Date when driven.	Number of piles.	Average length.	Total piling used.	Average penetration.	Number strokes of hammer.	Fall at last stroke.	Penetration at last stroke.	Remarks.
1884.		*Feet.*	*Feet.*	*Feet.*		*Feet.*	*Inches.*	
Aug. 11–20	18	32.6	871	13.7	.....	.....	.....	180 feet have been used for 3 piles at Memphis.
21–31	95	34.0	4,853	14.0	25	25	2.5	
Sept. 1–10	82	33.1	3,860	12.2	29	21	1.4	
11–20	86	37.3	4,631	17.5	38	16	1.9	Driven with jet.
21–30	63	53.6	3,349	16.9	43	24	0.9	180 feet have been used for 3 piles at Memphis.
Total	344	.....	17,564	.....	.....	.....	.....	
Average...	.....	38.1	.....	14.9	34	21.5	1.7	

TABLE 3.—*Construction of mattresses, Memphis Harbor.*

Mattresses made.		Mattresses sunk.		Mattresses lost in sinking.	
Date.	Size.	Date.	Size.	Date.	Size.
1884.	*Feet.*	1884.	*Feet.*	1884.	*Feet.*
July 20–31	200 by 144	.....	.....	.....	.....
Aug. 1–10	378 by 144	Aug. 5	289 by 144	.....	.....
1–10	183 by 144	Aug. 9	472 by 144	.....	.....
11–20	457 by 300	.....	.....	.....	.....
11–20	600 by 150	.....	.....	.....	.....
21–31	233 by 300	Aug. 22	600 by 150	.....	.....
21–31	465 by 150	Aug. 26	365 by 300	Aug. 26	225 by 300
21–31	106 by 250	Aug. 26	300 by 100	.....	.....
		Aug. 29	425 by 150	.....	.....
Sept. 1–10	1,149 by 150	Sept. 6	240 by 250	Sept. 6	239 by 250
1–10	373 by 250	.....	.....	.....	.....
11–20	576 by 150	Sept. 11	350 by 150	.....	.....
11–20	.....	Sept. 11	875 by 150	.....	.....
21–30	652 by 150	Sept. 25	908 by 150	.....	.....
Total squares	9,526.3		7,827.8		1,272.5

TABLE 4.—*Construction of mattresses, Hopefield Bend.*

Mattresses made.		Mattresses sunk.		Mattresses lost in sinking.	
Date.	Size.	Date.	Size.	Date.	Size.
1883.	*Feet.*	1883.	*Feet.*	1883.	*Feet.*
Nov. 1–10	837 by 140	Nov. 6	961 by 140	.....	.....
11–20	1,100 by 140	Nov. 20	1,561 by 140	.....	.....
21–30	1,057 by 140	.....	.....	Nov. 21–30	1,057 by 140
Dec. 1–10	862 by 140	Dec. 5	386 by 140	.....	.....
11–20	802 by 140	Dec. 20	790 by 140	.....	.....
21–31	700 by 140	Dec. 24	767 by 140	.....	.....
	.....	Dec. 27	190 by 140	.....	.....
	.....	Dec. 31	210 by 140	.....	.....
1884.		1884.		1884.	
Jan. 1–10	181 by 140	.....	.....	Jan. 1–10	203 by 140
Sept. 11–20	770 by 150	.....	.....	.....	.....
21–30	508 by 150	Sept. 27	1,115 by 150	.....	.....
Total squares	9,671.6		8,525.5		1,764.0

TABLE 5.—*Monthly expenses of work, November* 1, 1883, *to October* 1, 1884, *Memphis Reach and Harbor.*

Items.	November, 1883.	December, 1883.	January, 1884.	February, 1884.	March, 1884.	April, 1884.	May, 1884.	June, 1884.	July, 1884.	August, 1884.	September, 1884.	Total.	Total.
Office and fleet	$2,420 04	$1,369 84	$1,869 07	$1,367 06	$1,161 65	$1,060 02	$1,066 84	$2,977 01	$2,045 74	$2,550 38	$1,418 63	$19,306 28	$19,306 28
Steamer H. M. Graham	1,518 78	1,271 73	474 10	435 00	900 51	500 51	744 57	1,572 72	1,347 33	841 62	1,052 56	10,659 43	.....
Steam-launch Daphne	242 94	239 32	227 39	154 04	167 48	165 96	188 70	338 47	175 50	189 44	.....	2,089 24	.....
Steam-tug Ida Patton	.....	.....	.....	.....	.....	.....	.....	.....	125 00	941 17	916 20	1,982 37	.....
Steam-tug Clarence	.....	146 80	537 77	.....	.....	.....	.....	.....	.....	.....	.....	684 57	15,415 61
Survey	.....	.....	.....	.....	.....	.....	207 39	498 81	523 21	384 55	416 10	2,030 06	2,030 06
Repairs to plant and machinery	546 74	530 92	266 25	265 29	145 18	885 63	893 15	2,297 11	2,169 66	3,153 34	3,470 00	14,623 27	14,623 27
Mattressing Hopefield Bend	20,746 44	15,297 75	2,413 90	.....	.....	.....	.....	.....	.....	2,540 92	9,645 52	50,644 53	.....
Grading Hopefield Bend	829 49	499 25	.....	.....	.....	.....	.....	.....	.....	375 24	905 14	2,609 12	.....
Clearing bank Hopefield Bend	.....	.....	.....	.....	.....	.....	.....	.....	.....	120 30	235 15	355 45	.....
Pile driving Hopfield Bend	.....	.....	.....	.....	.....	.....	.....	.....	.....	667 18	1,110 17	1,777 35	.....
Snagging Hopefield Bend	94 50	.....	.....	.....	.....	.....	.....	.....	272 37	444 78	.....	811 65	56,198 10
Mattressing Memphis Harbor	.....	.....	.....	.....	.....	.....	.....	.....	1,425 99	16,040 08	18,330 26	35,796 33	.....
Grading Memphis Harbor	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,457 06	2,457 06	.....
Draining Memphis Harbor	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	230 85	230 85	.....
Hauling bark Memphis Harbor	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	157 38	157 38	.....
Removing piles, Memphis Harbor	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	452 50	452 50	39,094 12
General service, coaling steamers	81 00	133 90	137 50	.....	.....	.....	.....	.....	.....	.....	149 88	502 28	502 28
Total	26,479 93	19,489 51	5,925 98	2,221 39	2,374 82	2,612 12	3,100 65	7,684 12	8,084 80	28,249 00	40,947 40	147,169 72	147,169 72

TABLE 6.—*Itemized statement of expenses, November* 1, 1883, *to October* 1, 1884, *Memphis Reach and Harbor.*

Items.	General service.		General expense.							Revetment.				Total.	
	Coaling steamers.		Office and fleet.		Towing.		Survey.	Construction and repair of plant and machinery.		Memphis Harbor.		Hopefield Bend.			
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Pay-roll		$22 83		$12,976 62		$4,690 20	$1,588 50		$7,762 88		$13,950 11		$14,852 85		$55,843 99
Subsistence		2 82		3,671 12		1,425 92	424 34		1,687 69		3,720 45		6,487 37		17,419 71
Brush ..... cords										7,261	9,656 29	10,619	18,406 05	17,870	28,062 34
Stone ..... cubic yards			5,888	788 88						7,403	4,769 96	6,336	11,468 40	13,739	17,027 24
Iron ..... pounds								2,839	93 94	39,760	1,479 56			42,599	1,573 40
Piling ..... linear feet												17,352	1,145 43	17,352	1,145 43
Poles ..... cords										495	800 85	352	560 70	847	1,361 55
Wire ..... pounds										55,694	2,561 83	37,052	1,837 22	92,746	4,399 05
Spikes ..... kegs										160	762 75	42	320 95	202	1,083 70
Wire rope ..... linear feet										10,000	568 83			10,000	568 83
Lumber ..... B. M. feet								121,017	2,787 03					121,017	2,787 03
Coal ..... bushels	4,165	476 63	5,118	705 06	17,335	1,990 16		1,223	109 90			1,634	182 60	28,375	3,464 35
Hire of teams											157 38				157 38
Hire of tow-boat and tug				676 00		6,253 00									6,929 00
Diver (removing piles)											452 50				452 50
Miscellaneous				488 60		1,056 33	17 22		2,181 93		213 61		936 53		4,894 22
Total		502 28		19,306 28		15,415 61	2,030 06		14,623 27		39,094 12		56,198 10		147,169 72

H 2.

REPORT OF J. E. TURTLE, ASSISTANT ENGINEER, UPON OPERATIONS AT PILCHER'S POINT.

UNITED STATES ENGINEER OFFICE,
Pilcher's Point, La., October 6, 1884.

SIR: The following report of operations of work done at Pilcher's Point, La., from November 1, 1883, to October 1, 1884, is respectfully submitted.

The object of the work at this point was to hold the present shore-line, thus preventing a deflection of the current to the Mississippi side below, which deflection was supposed would cause serious damage to the work at head of Duncansby Chute.

The plan adopted to hold the present shore-line was by woven willow mattresses, which are supposed to cover, when sunk, a sufficient amount of the slope to prevent erosion; and by upper bank revetment.

On November 1, 1883, there were employed at this point two mattress parties, one brush party, snag-boat O. G. Wagner, and tow-boat Pearl.

Owing to a scarcity of labor in summer of 1883 the work did not get well under headway until about November 1, 1883. On November 6, owing to a low condition of funds, Captain Marshall, U. S. A., issued instructions to drop mat construction as soon as practicable and transfer one of the mat parties to Island No. 93. The latter part of these instructions were carried into effect November 24.

On December 15 the upper mat party at this point was disbanded, and such of them retained as was necessary to store track lumber for winter.

On December 17 brush party was also transferred to Island No. 93, to assist in the completion of the work at that point before high water.

Party retained at Pilcher's Point was disbanded December 26, 1883. Parties on Island 93 disbanded, one on December 29, one on January 8, 1884.

Snag-boat O. G. Wagner continued work until 11 a. m., November 7, when a crack occurred in her boiler. On November 15 J. R. Meigs reported to take place of Wagner.

On November 30 Wagner was taken in tow by the steamer Mississippi and delivered to Major Miller.

Meigs continued work until December 18, when pulling snags was abandoned. On December 19 she departed for Memphis, to be delivered to Major Miller.

Tow-boat Pearl was employed until December 28. On December 29 she was taken in tow by steamer Mississippi, to be delivered to owners.

Quarter-boats and mat-barges were placed with the fleet at Wilson's Point, property checked and placed under lock and key.

On January 28 a small force was organized for the purpose of furnishing mattress poles and stringers to construction party at Wilson's Point. On February 11 water got over bank, and work was abandoned.

On April 7 a small force was again organized to supply braces and stringers to party at Wilson's Point. Timber was cut from skiffs and floated to barges. This work continued until May 27, then, owing to a falling river, was abandoned, and clearing caving banks of timber was begun. This latter work was continued until June 23, when mat construction commenced, and since that date has been pushed as rapidly as the class of labor and hot weather would permit.

The head of the mat work this season overlaps the lower end of mat sunk in 1883.

After an unsuccessful attempt to remove the snags from this bend—first with a pile-driver, and after with grader No. 3—a diver was procured, the object being to cut off the snags by means of dynamite. The cartridges used were half-pound Hercules powder, one or more being used as the size of snags demanded. Cartridges were tied against the snags, close to the bottom, and exploded with a battery. This means of removing snags proved a perfect success.

The diver (Mr. Howard) has examined the upper mat (1,690 feet in length) sunk in 1883, and all the mat sunk in 1884. The mat of 1883 was found to be in a good state of preservation, and to be well done on the bottom, the outer edge resting on a stratum of blue clay.

On the evening of September 19, a cave occurred which injured about 100 feet of the mat sunk in 1884. The slide is supposed to be caused by the grader, which was grading at the time at the point where the slide took place. With the exception of this 100 feet, the mat sunk in 1884 was found to be in good condition, the outer edge resting on a stratum of blue clay.

Grader No. 3 was received from Wilson's Point on the evening of July 31, and began grading on August 1. Much delay was occasioned at first by inexperienced labor—poor quality of hose (used last season), sickness of engineer, and a crack in pump chamber.

On September 15, grader No. 1 was received from Vicksburg, and put to work at once;

since then a double crew has been employed, and good progress made. This work has been under the charge of Assistant Engineer H. Steubing.

Carpenters have been employed overhauling mattress barges, quarter-boats, building addition to office, and in general repairs.

Blacksmith has been employed welding mat rods, and on general repairs.

The steamers Osceola and Etheridge have done the local work.

There has been an abundant supply of material.

DESCRIPTION OF WORK.

The mattresses employed here are the common woven mattress of willow, and have been explained in detail so often that explanation here is deemed unnecessary. The widths used are 180, 168, and 165 feet (these widths do not include Grillage mat), and have been made continuous, the longest mat being 3,440 by 180 feet.

Previous to sinking, the mats have been well ballasted (flotation destroyed) their entire lengths, or over such lengths as were to be sunk from time to time. The head or up-stream ends are sunk first by pulling a barge loaded with rock over the mat, beginning about 250 feet below the head, and then towards it; when the head is reached it is loaded with sufficient rock to carry it rapidly to the bottom; the straps (from 12 to 16 in number) that anchor the mat to the mooring barge are let go simultaneously. The anchor lines that hold the mat to the shore are sunk with it, and by means of shackles and trip-lines, made fast to buoy, are released when a sufficient quantity of the mat is on the bottom to secure its safety.

Every 300 feet mats are made fast to shore by 2-inch manila (two lines abreast on the outer half of the mat); these lines are also sunk with the mat and treated as the head lines.

The upper bank revetment consists of courses of willow brush placed upon a frame-work of poles, and are held in place by cross poles firmly wired to frame-work underneath.

GENERAL REMARKS.

On June 1, 1884, it was found that the upper mat (1,690 feet in length) sunk in 1883, was still in place, no caving having occurred behind it; the lower mat (2,308 feet in length) was found to be gone.

A resurvey of the shore-line along this mat indicated the least caving to be 150 feet, the greatest 600 feet, it being greatest at the lower end. As this was a detached piece of work, situated at the worst point in the bend, other results could not be expected. It is deemed advisable not to revet the lower one-half or three-quarters of a mile of this bend, as it is hoped if this is left unprotected it will wash away during the high water, thereby materially assisting in carrying into effect the purpose of the work.

If the work done this season will be found in perfect condition after the high waters of 1885, the revetment of the above three-fourths of a mile will be all that remains to be done to finish the work at this point, requiring an expenditure of about $42,000.

The progress of the work has been greatly delayed by the shifting class of labor employed. The work at first is entirely new to them. As soon as they become acquainted with it they are ready to leave.

Number of laborers that commenced work in August and were paid off before the month closed, was 287; in September, 350.

I feel under obligations to the employés on the work for the faithful and untiring manner in which they have performed their duty, and to Assistant Engineer Arthur Hider for the prompt and agreeable manner in which he has responded to my requisitions for material and different pieces of his plant.

Appended hereto is summary of work done, material expended, and statements of cost of work.

Statement of cost of work done at Pilcher's Point, Lake Providence Reach, from November 1, 1883, to October 1, 1884.

Description.	Pay-roll.	Subsistence.*	Material.	Totals.
Mat and bank revetment	$37,002 25	$9,532 49	$63,751 29	$110,286 03
Snag-boat	1,678 95	383 13	163 50	2,225 58
Brush party	4,522 75	1,441 86	326 11	6,290 72
Grading	2,078 00	369 90	145 00	2,592 90
Supplying braces and stringers to Wilson's	1,578 83	284 35	.....	1,863 18
Clearing caving bank of timber	367 00	113 34	.....	480 34
Work during suspension	301 49	44 25	.....	345 74
Total	47,529 27	12,169 32	64,385 90	124,084 49

*Daily cost per ration raw, 25.4 to 32.8 cents; daily cost per ration for actual labor on time list, 39.8 cents.

Work done.

Description.	Length.	Width.	Remarks.
	Feet.	*Feet.*	
Bank graded	5,275	78	
Do	6,146	78	Shoveled.
Bank cleared of timber	8,850	75	Preparatory to grading.
Timber cleared from caving banks	9,240	200	

Work done—Continued.

Description.	Quantity.	Locality.	Remarks.
Snags removed, number	369	Pilcher's Point	
Do, do	172	do	By divers.
Logs removed, do	128	do	
Brush cut and loaded, cords	4,240	Sarah's Island	
Poles cut and loaded, do	151	Pilcher's Point	
Stringers cut and loaded, number	866	do	For Wilson's Point.
Braces cut and loaded, do	729	do	
Track laid, linear feet	15,510	Sarah's Island	
Track corduroyed, do	2,826	do	
Track stored for winter, do	14,030	Ashton	

Carpenter work.—Ventilators put on three quarters-boats; hold of No. 35 fitted for dining-room; addition to office completed.

Painting.—Roofs of three quarters-boats painted.

Respectfully submitted.

J. E. TURTLE,
Assistant Enginesr.

CLINTON B. SEARS,
Captain of Engineers, U. S. A.

Statement of material expended at Pilcher's Point, Lake Providence Reach, from November 1, 1883, to October 1, 1884.

Brush	cords	19,325.1
Poles	do	1,710.6
Iron	pounds	86,209
Spikes	do	33,118
Cut nails	do	2,205
Wire	do	80,221
Links	do	2,420
Staples	gross	57
Clevises	pounds	765
Stone	cubic yards	8,666.9
Coal	bushels	8,990
Lumber	feet	10,158
Mineral paint	pounds	652
Shingles	number	3,500
Linseed oil	gallons	70
Hercules powder	pounds	175
Primers	number	200
Car grease	pounds	400

Statement of work done at Pilcher's Point, Lake Providence Reach, from November 1, 1883, *to October* 1, 1884.

Description.	Length.	Width.
	Feet.	*Feet.*
Mattress constructed *	1,030	150
Do *	5,372	180
Do *	460	160
Do *	1,245	.....
Do *	4,195	165
Do *	1,779	168
Total	14,081	166.5
Grillage	1,768	50
Upper bank revetment	1,395	60
Do	4,330	78
Mattress sunk	1,030	150
Do	5,372	180
Do	460	160
Do	1,245	.....
Do	3,074	165
Do	1,779	168
Total	12,960	166.5

* These widths do not include grillage.

H 3.

REPORT OF W. M. CHILDS, ASSISTANT ENGINEER, UPON OPERATIONS AT MAYERSVILLE ISLAND, WITH SUBREPORT UPON EXAMINATION OF SUBAQUEOUS MATTRESSES.

WILSON'S POINT, LA., *October* 1, 1884.

SIR: The work under my charge for the eleven months ending September 30, 1884, was confined to the protection of the face of Mayersville Island by subaqueous mattress and revetment, and to making woven and grillage foot-mats, tilted screens and wattling at the cottonwood system of dikes.

Careful examinations were made in September, by a marine diver, of the subaqueous mattress along the entire face of Mayersville Island (see subreport marked Appendix H 3[1]).

From the head of the island to a point 300 feet below range 52 the mattress has had a strong current to withstand, and is somewhat broken near the low-water line. The revetment is good, but has been repaired in places several times.

From a point 300 feet below range 52 to a point 180 feet below range 55 the subaqueous mattress and revetment are in good condition. Over 1,500 linear feet of subaqueous mattress and revetment has been built to keep work now standing in repair.

Work done at the cottonwood dikes is in good condition throughout.

Below is an estimate of the labor cost for 100 linear feet of bank protection work:

150 squares woven mattress, at $1.25	$187 50
10 squares grillage mattress, at $2.37	23 70
Grading mattress, at 31 cents	31 00
50 squares revetment, at $2.37	118 50
Total	360 70

Add cost of material:

150 cords brush, at $1.75	$262 50
147 cubic yards stone, at $2	294 00
12 cords poles, at $2	24 00
130 pounds spikes, at 4 cents	5 20
225 pounds wire, at 7 cents	15 75
1,000 pounds iron rods, at 5 cents	50 00
	651 45
Towage estimated at 33⅓ per cent. of tow-boat service	70 80
Total cost for 100 linear feet	1,082 95
Cost per single foot	10 83

Recapitulations of work done and percentage washed out (not including Assistant Engineer J. E. Turtle's work).

Woven mattress:	Linear feet.
Mayersville Island (in good condition)	5,735
Cottonwood dikes (in good condition)	4,602
Mayersville Island (washed out)	3,798
Total	141.35

26⅘ per cent. washed out.

Grillage mattress, Mayersville Island, 780 linear feet washed out.

100 per cent. washed out.

Grillage foot-mat, cottonwood dikes (in good condition)	linear feet..	4,058
Wattling foot-mat, cottonwood dikes (in good condition)	do....	2,571
Tilted screen, cottonwood dikes (in good condition)	do....	1,487
Rod braces put up, cottonwood dikes	number..	709

Revetment:	Linear feet.
Mayersville Island (washed out)	6,578
Mayersville Island (in good condition)	5,735
Cottonwood dikes (in good condition)	120
Total	12,433

52$\frac{11}{12}$ per cent. washed out.

	Linear feet.
Grading Mayersville Island (in good condition)	86.11
Grading Cottonwood dikes (in good condition)	1.20
Total	87.31

Of mattress work in good condition, as per last yearly report, 100 per cent. is now washed out.

Tabulated statement of location, amount and cost of work done, and material expended, accompanies this report, marked Appendix H 3[1].

Respectfully submitted.

Your obedient servant,

W. M. CHILDS,
United States Assistant Engineer.

To ARTHUR HIDER,
United States Assistant Engineer in charge.

H 3[1].

REPORT OF W. M. CHILDS, ASSISTANT ENGINEER, UPON EXAMINATION OF SUBAQUEOUS MATTRESSES.

WILSON'S POINT, LA., *October* 4, 1884.

SIR: I have the honor to make the following report of examinations of subaqueous mattress off the face of Mayersville Island, made by a marine diver.

From the head of the island (1,100 feet above range 52) down-stream 500 feet the mattress is in good condition and lies on a gradual slope. Between points 500 and 600 feet below head of island the mattress is badly broken. There are two places in this distance of 100 feet where the mattress is entirely gone out. Below the head of the island 900, 1,000, and 1,100 feet the mattress is broken in places along the low-water line and in two places is broken away from the grillage mat and settled down 3 or 4 feet below the outer edge of the latter. For 75 feet out from the shore the mattress seems in good condition, well ballasted, and lies on a gradual slope.

The revetment from the head of the island down 1,400 feet is very steep and at the water surface and in some places shows signs of giving way. From a point 1,400 feet below the head of the island to a point 180 feet below range 55, a distance of 6,900 feet, the mattress and revetment are in good condition, and lie on an easy slope. At some places along this stretch the river bed has washed down 3 or 4 feet below the outer edge of the mattress.

The current was so swift the diver could reach the outer edge of the mattress only between ranges 53 and 58.

About 350 feet below range 55, a piece of mattress about 100 feet in length was found and in good condition; 200 feet below this a small patch was found, but from there down nothing of brush or stone was found. The current was quite swift along the lower part of the island and the diver could not go more than 50 feet from shore.

All mattress work found was well ballasted with rock, and was almost covered with sand. Even along the head of the island where is the most current the mattress was well buried in sand. A good deal of light sediment has settled on the mattress between ranges 53 and 55.

Pieces of brush were broken off and brought up, and seem in a good state of preservation. No difference could be detected between brush that had been down one year from that which had been down two years.

Respectfully submitted,

W. M. CHILDS,
United States Assistant Engineer,

To ARTHUR HIDER,
Assistant Engineer in charge.

Description of work done.	Location.	Length.	Width.	Squares.	Rate. Per linear foot.	Rate. Per square.	Cost. Pay-roll and subsistence.
Woven mattress	Mayersville Island	2,906	151	4,388	.....	.....	.....
Do	do	2,829	135	3,819	.....	.....	.....
Do *	do	310	125	387	.....	.....	.....
Do †	do	904	110	994	.....	.....	.....
Do ‡	do	1,774	100	1,774	.....	.....	.....
Do †	do	407	71	289	.....	.....	.....
Do †	do	403	45	182	.....	.....	.....
Do	Cottonwood Dikes	2,975	75	2,231	.....	.....	.....
Do	do	1,627	60	976	.....	.....	.....
		14,135	.....	15,040	$1.328	$1.248	$18,773 16
Do §	Mayersville Island	1,395	140	1,953	.....	.....	.....
Do	do	15,530	.....	16,993	.....	.....	.....
Grillage mattress †	do	780	50	390	1.186	2.372	925 06
Do §	do	1,395	32	446	.....	.....	.....
		2,175	.....	836	.....	.....	.....
Revetment ‖	do	12,313	.....	6,511	.....	.....	.....
Do	Cottonwood Dikes	120	.....	103	.....	.....	.....
		12,433	.....	6,614	1.259	2.367	15,654 56
Do §	Mayersville Island	1,395	60	837	.....	.....	.....
		13,828	.....	7,451	.....	.....	.....
Grading	do	8,611	.....	70,799	.....	.....	.....
Do	Cottonwood Dikes	120	.....	250	.....	.....	.....
		8,731	.....	71,049	.3069	.0377	2,679 74
Grillage for mattress	do	1,924	60	1,154	.....	.....	.....
Do	do	2,134	35	747	.....	.....	.....
		4,058	.....	1,901	.4864	1.038	1,973 69
Wattling	do	2,571	.....	259	.1889	1.875	485 71
Filted screen	do	1,487	35	520	.2039	.5832	302 26
		(¶)	.....	.....	(**)	.....	.....
Rod braces put up	do	709	.....	.....	.2123	.....	150 53
		(††)	.....	.....	(‡‡)	.....	.....
Brush cut and loaded	Mayersville Island	2,045	.....	.....	3,224	.....	6,593 83
							47,539 54

* Built to repair slides. † Washed out. ‡ 525 linear feet washed out; 1,249 linear feet built to repair slides. § Work done by Assistant Engineer J. E. Turtle. ‖ 5,029 linear feet washed out; 1,549 linear feet built to repair slides. ¶ Number. ** Per rod. †† Cords. ‡‡ Per cord.

Material expended.

Stone	cubic yards	15,791
Brush	cords	16,344
Poles	do	1,155
Spikes	pounds	12,557
Iron rods	do	76,467
Wire	do	52,891

H 4.

REPORT OF C. P. RUPLE, ASSISTANT ENGINEER, UPON OPERATIONS OF DIKE PARTY.

WILSON'S POINT, LA., *October* 1, 1884.

SIR: I have the honor to submit herewith the following report of operations, cost of work, and maintenance of what is here known as the dike party, under my charge, from November 1, 1883, to October 1, 1884.

This party was under active operation at time of last report, made November 1, 1883, and continued so until January 7, 1884, at which time work was entirely suspended on account of high water, and the force disorganized.

At this time but little pile-driving was being done, the principal work consisting in completing the dike already driven, by the construction and sinking of foot-mats, wattling, &c. Fortunately this work was complete to such an extent that what remained unfinished was of little or no consequence.

During the high water, and while the levees on this reach between Wilson's Point, Louisiana, and Concordia Landing, Louisiana, were in danger, I was detailed on patrol duty over this section, also superintending such work as was done to preserve and keep the levees intact, by building revetments of lumber to prevent caving, and when the levee was low or had been cut through, by raising such places with rows of sacks filled with earth placed along the outer edge of the levee.

On the 1st of April, 1884, the force was reorganized and pile-driving resumed by the commencement of the cottonwood system of dikes, completing this and moving in turn to Baleshed, Stack Island, and Duncansby.

During my absence on leave, from April 23 to June 20, work was continued under the charge of Assistant Engineer E. C. Tollinger.

No dike work has been done since August 15.

The force was then reduced (on account of the unhealthy season) to a few men, and the party engaged in miscellaneous work—at the present time loading rock from the bank onto barges, at Wilson's Point, Louisiana.

On August 28 I took charge of a party to make a special survey of Greenville Harbor, Mississippi, completing this and returning to Wilson's Point September 4, the object of this survey being to secure data upon which to base an estimate of such work as would be necessary to preserve this harbor from further encroachments of the river.

The following is a tabulated statement giving in detail the work done:

Statement showing dike and brush work as done by dike party from November 1, 1883, *to October* 1, 1884.

Location and dike.	Number of feet driven from November 1, 1883, to October 1, 1884.	Foot-mat between piling.				Woven mat along piling.	
		Made.		Sunk.			
		Lin. feet.	*Sq. feet.*	*Lin. feet.*	*Sq. feet.*	*Sunk.*	*Width.*
Duncansby:							
Main between 6 and 7	1,677	1,677	67,080	477	19,080		
No. 3		150	7,500	150	7,500		
No. 4	1,882	2,032	69,602	1,832	63,602		
No. 6	517	805	32,380	805	32,380		
No. 7	138	782	23,840	1,273	54,420		
No. 8	56	56	2,520	716	38,645		
Cottonwood:							
Main outer	4,471						
Main inner	1,350						
No. 1	863						
No. 2	1,285						
No. 3	558						
Mayersville:							
No 1	100	900	43,870	900	43,870		
Baleshed:							
Main	134	1,750	78,820	1,912	89,489	1,594	60
Main between 1 and 3	2,850						
No. 3				672	29,624		
New 4 under old 4	1,207						
New 5 under old 5	1,206						
No. 5 old	100	354	13,660	829	33,160		
No. 6	366						
No. 7	100			75	3,750		
No. 8	100						
Stack Island:							
Main	2,249	2,369	95,760	2,369	95,760		
No. 1	2,636	2,134	88,895	2,134	88,895		
Totals	23,845	12,964	523,927	14,144	600,175	1,594	60

Statement showing dike and brush work as done, &c.—Continued.

Location and dike.	Shore mat or revetment made and sunk.	Screens hung.		Wattling.		Tip grillage wattling made and sunk.	
Duncansby:	*Sq. feet.*	*Lin. feet.*	*Sq. feet.*	*Lin. feet.*	*Sq. feet.*	*Lin. feet.*	*Sq. feet.*
Main between 6 and 7							
No. 3							
No. 4	1,600	170	3,260			1,280	38,400
No. 6	5,500			1,675	15,731		
No. 7							
No. 8				1,650	10,868		
Cottonwood:							
Main outer							
Main inner							
No. 1							
No. 2							
No. 3							
Mayersville:							
No. 1	900						
Baleshed:							
Main				1,865	11,525	2,647	105,416
Main between 1 and 3							
No. 3	3,300	300	9,000	872	6,800		
New 4 under old 4							
New 5 under old 5							
No. 5 old							
No. 6				400	2,400		
No. 7				915	6,405		
No. 8							
Stack Island:							
Main							
No. 1							
Totals	19,400	470	12,260	7,377	53,729	3,927	143,816

Of this there are—

	Linear feet.
Two rows	4,873
Three rows	18,792
Four rows	180
Total	23,845

Amount of pay-roll	$37,454 22
Subsistence	9,227 50
Total	46,681 72
Labor loaned other parties	366 93
Total to be accounted for	46,314 79

Distributed as follows:

1. Pile-driving, including bracing	26,367 42
2. Brush work, foot-mats, &c., including sinking	16,310 87
3. Miscellaneous work:	
(*a*) Cleaning bank of timber	482 86
(*b*) Repairs to revetment, Island 93	1,309 99
(*c*) Ballasting revetment and foot-mats made by other parties not included in above statement	660 62
(*d*) Cutting and loading brush	448 61
(*e*) Loading material	482 19
(*f*) Raising and moving sunken driver	252 23
Total	46,314 79
8,046 piles driven, at $1.725—	13,876 69
5,383 braces put on, at $1.157+	6,231 17
3,193 stringers hung, at $1.96+	6,259 56
Total	26,367 42
Labor, cost per 100 linear feet, 2 new dikes	81 43
Labor, cost per 100 linear feet, 3 new dikes	120 87

For 1882–'83 the cost of the same class of work was $129.40 for a dike of two rows.

Average cost per 100 square feet foot-mat between piling :		
Making	$1,313 00	
Sinking	586 00	
		$1,899 00
Average cost per 100 square feet wattling		2 00
Average cost per 100 square feet tip-grillage wattling		2 10

Average number piles driven per day per driver, while working, $11\frac{3}{5}$.

Very respectfully,

C. P. RUPLE,
United States Assistant Engineer.

ARTHUR HIDER,
Assistant Engineer in charge.

H 5.

REPORT OF E. C. TOLLINGER, ASSISTANT ENGINEER, UPON LEVEES, VICINITY OF ILLAWARA, LOUISIANA, AND SKIPWITH, MISSISSIPPI.

WILSON'S POINT, LA., *October* 1, 1884.

SIR: During the high-water season I was detailed on special duty on levees in the vicinity of Illawara, La., and Skipwith, Miss., where danger of breaks was imminent, superintending the necessary protection work done by the Government at the former locality, and attending to other duties connected with the levees during the flood.

On April 23 I took charge of the pile-driving force then at work on Cottonwood Bar during Assistant Engineer Ruple's absence on sick-leave. This work was finished and the party moved to Baleshed, when a high-water main dike from 1 to 4 was driven, gaps in 4 and 5 closed, 4 and 5 strengthened from main dike and extended out into deep water, dikes 6, 7, and 8 extended as far as the depths of water would allow.

The party was then moved to Stack Island, and the construction of a dike across Baleshed Chute, about the head of Stack Island, begun. This work was well under way when Assistant Engineer Ruple returned, June 20.

In the mean time, a gap broke through main Baleshed Dike below No. 5, and was continually increasing in size, with a rapid current flowing through. A force of pile-drivers was put to work closing the break in this dike.

All work done by me from April 23 to June 20, while I was temporarily in charge of the party, is included in Assistant Engineer C. P. Ruple's report. On July 1 a separate party was organized, and the following work done:

MAYERSVILLE SYSTEM.

Dike No. 1 repaired. The work done here was to close the break made during the flood, which was done by a dike in front of the gap and a thick foot-mat.

BALESHED SYSTEM.

Main dike from 3 to 5, to protect dike driven in 1882, which showed signs of weakness. Dike immediately below No. 5—to close break, foot-mat made from 3 to 6, incline grillage built from 5, crossing the break, to retard the flow of water passing through the gap. In front of this gap some old condemned coal-barges were sunk. The deep water and strong current passing through the break while this work was being done rendered it exceedingly difficult and costly. Assistant Engineer Stenbing's force was placed in my charge August 1, he having been assigned to other work. The construction of foot-mats was completed at this locality and on August 9 the force transferred to Wilson's Point, and has since been engaged in loading rock from the bank for use at Pilcher's Point. This work has been done during the hot weather with a small force, it being impossible to retain men at wheeling rock when other work could be obtained, and has been done at a very considerable disadvantage.

The statements below show the locality and amount of work done from July 1 to October 1, 1884:

DIKEWORK (PILE-DRIVING).

Location.	Description.	Driven since July 1, 1884.	Remarks.
		Feet.	
Mayersville	Cross-dike 1	649	Closing breaks.
Baleshed	Main dike between 3 + 5	1,508	Protection dike.
Baleshed	Main dike below 5	1,163	600 of this closes break.
Total		3,320	

	Feet.
2-row	590
3-row	2,049
4-row	681
Total	3,320

DIKE WORK (BRUSH).

Locality.	Foot-mat between piling.				Tipped screen.				Revetment.
	Made.		Sunk.		Made.		Sunk.		
	Linear feet.	*Square feet.*	*Linear feet.*	*Square feet.*	*Linear feet.*	*Square feet.*	*Linear feet.*	*Square feet.*	*Square feet.*
Mayersville No. 1, between 3 and 6	597	20,010	597	20,010	.....	.....	.....	.....	6,300
Baleshed main dike	1,975	67,065	1,975	67,065	.....	.....	.....	.....	.....
Baleshed main dike below 5	.....	.....	.....	.....	882	39,690	882	39,690	.....
Total	2,572	87,075	2,572	87,075	882	39,690	882	39,690	6,300

The following is a summary of the amount and cost of labor:

Amount of pay-rolls	$6,311 13
Subsistence	1,612 36
Total	7,923 49

1,246 piles driven, at $2.51+	$3,055 05
408 stringers in place, at $1.62+	660 99
1,000 braces in place, at 51 cents+	514 60
87,075 squares foot-mat, at $1.15+	1,001 36
396.9 squares tipped screen, at $1.05	416 74
63 squares revetment, at $1	63 00
3,993 cubic yards stone, loaded, at 42 cents+	1,687 70
Sinking barges gap in Baleshed	148 05
Miscellaneous, loading piles, and repairs to drivers	276 00
Coaling steamboats	100 00
Total	7,923 49

Respectfully submitted.

E. C. TOLLINGER,
Assistant Engineer.

ARTHUR HIDER,
Assistant Engineer in charge.

H 6.

REPORT OF E. D. THOMPSON, ASSISTANT ENGINEER, UPON SURVEYS LAKE PROVIDENCE REACH.

WILSON'S POINT, LA., *October* 4, 1884.

SIR: The following report, from November 1, 1883, to October 1, 1884, is respectfully submitted:

FIELD WORK.

General surveys.—Three of these, each extending from Ashton to Point Lookout, have been received, viz, two at medium stage, in February and July, and one at flood stage in April, 1884. They included, besides the hydrography, the determination of changes in shore-lines caused by caving banks, and the location of exposed bars and of construction works. Eighty regular ranges were sounded for each survey, the soundings being located by either sextant or transit angles. For the February survey, the shore-line was re-run on both sides of the river the entire length of the reach.

SPECIAL SURVEYS.

These have been made for two purposes: First, to determine the fills and scours due to the contraction works, and, second, to ascertain "whether, in a well-marked bend, where there are caving banks, there is a deposit during falling stages, and, if so, its amount and character, and conversely if a scour takes place during rising stages."

For the first, complete local surveys, including cross-section and longitudinal soundings, were made immediately preceding the construction of any new works, and also for the works standing November 1, 1883, the observations being frequently repeated to ascertain the effects.

For the second, three ranges, each 1,000 meters apart, were selected in Louisiana Bend and sounded frequently during rising and falling stages. These surveys commenced February 4; they were repeated as frequently as possible during the rise of that month and in March. From June to October they were continued, but, owing to the fluctuating stages of the river during that time, now rising and then falling, it is not desirable to base general deduction upon the results of the latter surveys.

A table accompanying this report shows some of the results obtained.

DISCHARGE OBSERVATIONS.

In accordance with instructions received from Capt. W. L. Marshall, a section for the measurement of discharge was located at Wilson's Point in November, 1883.

The observations have been made, in point of time, as follows:

Where the river was below mid-stage (18.2 L. P. gauge), once per month; when above mid-stage, once per week.

During the flood stage, in March, they were made daily or on alternate days until the maximum discharge had been determined.

This was 1,151,230 cubic feet per second, with a mean velocity of 6.2002 feet per second (L. P. gauge, 38.11).

All the velocity observations were taken with a W. G. Price current meter, used from a catamaran in the usual manner. No anchorages were used, the apparatus being held in place by a steamboat. Eleven velocity verticals were used for each set of observations, the data taken at each vertical, consisting of a run of five consecutive minutes at mid-depth and an integration. The velocity stations are located on the discharge section by ranges on shore making angles of 45° with it.

With a small stern-wheel boat, no trouble was experienced in maintaining any desired position in the river.

When located, the section crossed the head of Cottonwood Bar, but the movement of this bar down-stream has since been quite rapid, the result being to more nearly equalize the depths on the entire section. In connection with the discharge observations, bench-marks were established on both banks for the determination of local slope. The gauge used by the observation party at Hays' Landing, in 1881–'82, was also re-established, in order that comparisons might be made between the observations taken there the previous season and those at Wilson's Point. In all, thirty-four measurements have been made. Maps showing the following curves, viz, velocity, area, discharge, mean depth, and mean velocity, derived from the observations, together with those of the Lake Providence and discharged-section gauges, accompany this report, also a table of results obtained.

SLOPE OBSERVATIONS.

These were taken at twelve stations on the reach from Carolina to Hays' Landing, the distances between the stations averaging about 3 miles; four complete sets have been obtained, including a series of high-water marks for 1884. Their elevations referred to zero of L. P. gauge are as follows:

	Feet.
Carolina Landing, Miss	46.493
Ashton Landing, La	45.596
Pilcher's Point Landing, La	43.487
Wilson's Point Landing, La	41.698
Mayersville Landing, Miss	41.303
Lake Providence, La	38.400
△ Shipland, Miss	36.539
Hays' Landing, La	34.900

The elevation of the mark at Hays' Landing for 1884 is 0.117 foot higher than for 1882, and is attributed to backwater from the Yazoo River. The gauge records show that while at Wilson's Point, March 11 and 24, the gauge heights were the same, at Hays' Landing, on March 24, the gauge was 0.95+ foot higher than on the 11th instant.

GAUGES.

At Wilson's Point and Lake Providence, gauges have been maintained throughout the eleven months. New gauges were established as follows: Carolina, June 12, 1884; Pilcher's Point, June 12, 1884; Hays' Landing, February 12, 1884. The Pilcher's Point gauge was discontinued on account of caving banks. The four remaining gauges are read twice daily and reports rendered by the observers every ten days.

MISCELLANEOUS.

A rigid basis for maps has been kept up, including new triangulations where necessary, repairing and re-establishing ranges, and the determination of elevation, for new bench-marks when caving has occurred.

The systems of dikes have been resurveyed, construction works located for progress sketches, &c.

A survey of Greenville Harbor was made in September by a portion of the party in charge of Assistant Engineer C. P. Ruple, who has submitted a report on the same.

During August and September, soundings were taken on the shallow crossing of the reach every ten days. The depths reported are the least found in a channel 1,000 feet wide. The crossings sounded were, first, from △ MacMillan (Elton) to foot of Stack Island, and second, from Ben Lomond, Miss., to Shorts, La. On the first, in the channel usually run by steamboats, not less than 15 feet was found at any time, and recent soundings (October 2, 1884) show a least channel-depth of 21 feet (L. P. gauge, 6.00).

The cost of the party for eleven months has been as follows;

Amount of pay-roll	$10,356 65
Subsistence	1,957 36
Total	12,314 01
Average cost per month	1,119 45

Which amount does not include value of coal burned by steamboat.

OFFICE WORK.

One hundred and ten maps and 159 tracings have been made, including progress sketches. In addition, the discharge measurements have been computed, and the special surveys reduced by planimeter, and tables of results prepared and submitted (to June 8, 1884); besides this, a variety of miscellaneous work has been done, including a complete index of all maps and note-books belonging to the party and the Wilson's Point office.

Summary.

General surveys of reach	3
Special surveys	73
Discharge measurements	34

Slope observations	sets	4
Shore-lines	miles	119¼
Levels	do	45
△ built		8
△ located		2
Cross-section soundings (number located)		22,841
Longitudinal soundings		2,052
Maps made		110
Tracings		159

STAGE OF RIVER.

The river was above mid-stage, viz, 18.2 feet, L. P. gauge, two hundred and thirty-nine days, on the following dates, viz, November 18, 25, 28, December 20, 1883, and December 31, 1883, to July 28, 1884.

	Feet.
Highest reading, L. P. gauge, March 23, 1884	38.40
Lowest reading, L. P. gauge, September 30, 1884	5.85
Oscillation of river	32.55
Mean stage of river from November 1, 1883, to October 1, 1884	24.07

CAVING BANKS.

Louisiana Bend.—The length of caving bank in this bend extended during the flood stage from Range 18 to Range 26, 17,920 feet. The maximum amount of caving occurred on Range 24, viz, 1,000 feet; average annual rate was 575 feet.

This bank has since been mattressed nearly to Range 22. The channel followed the caving bank closely, sarah's Island bar enlarging accordingly. The deepest soundings taken in the bend during flood-stage was 151 feet on Range 18.

The current was then very swift with large whirls and eddies near the Louisiana shore. The decrease in datum areas on Range 18 from February 4, 1884 (L. P. gauge, 24.8), to February 22, 1884 (L. P. gauge, 37.45 feet), was 1,880 square feet.

No caving occurred on this section. On Range 22, where heavy caving took place during the same time, the increase of datum area was 11,688 square feet.

Ranges 31 *to* 34, *Mississippi* (*Island No.* 92).—The caving in this locality is not at all serious, excepting perhaps at △ Cordell, where it extends back 300 feet. No recent survey has been made to determine its rate. Length of caving bank, 5,670 feet.

Ranges 38 *to* 41½, *Louisiana.*—Length of caving bank, 5,660 feet; annual rate of caving, 130 feet.

Below mouth of Duncansby Chute, Mississippi.—The caving along this bank began in November, and has continued more or less ever since. Length of caving bank, 8,350 feet; annual rate, 175 feet.

Longwood Front.—Length of caving bank, 11,000 feet; annual rate, 125 feet.

Ranges 82 *to* 88 (*Montgomery's, La.*).—During the rising stage in January and February, 1884, rapid caving took place in this locality, destroying the old levee. Length of caving bank, 10,420 feet; annual rate, 275 feet.

Shipland Front, Ranges 94 *to* 100.—Slight caving occurred here during the flood-stage. Length of caving bank, 6,600 feet; annual rate of caving, 125 feet.

CHANGES ON REACH.

Duncansby Chute.—Upper Duncansby Tow-head was entirely washed away in February and March, 1884; at the same time a fill took place in the chute below, amounting to 1,035 feet on a section between Dikes 6 and 7.

For comparison, six sections were selected, Range 30 above the dikes, Ranges 36 S, 37 S, above and below Dike No. 6, and Ranges 40, 41, and 42 in the chute above Skipwith Landing.

The following statement shows the average amounts of fills that have taken place on the sections between the specified dates:

Average, December 3, 1883, to June 5, 1884:

	Feet.
Range 36 S	4.48
Range 37 S	10.35

Average, November 14, 1883, to June 5, 1884:

Range 40	2.58
Range 41	3.57
Range 42	2.89

The low-water channel is now where the upper tow-head formerly was.

COTTONWOOD BAR.

The construction of contraction works on this bar during the high stage has had the effect of building up a large bar behind them, and of throwing the channel directly into the bend of Island No. 93.

MAYERSVILLE CHUTE.

Four sections have been sounded for comparison in this chute, viz, one about 500 feet above the cross-dike and three below, from 500 to 850 feet apart.

The dike consists of five rows of piling, with a heavy drift accumulation in front.

From November 14, 1883, to June 4, 1884:

	Feet.
Range 52 shows a scour of	3.16
Range A shows a scour of	5.33
Range B shows a scour of	1.76
Range 53 shows a fill of	1.18

Range A is located below the dike, and the large amount of scour is due to a break, which occurred April 21, next Mayersville Island.

BALESHED CHUTE.

In this chute four ranges were selected for comparison.

From December 5, 1883, to June 6, 1884:

	Feet.
Range 60 S shows a fill of	4.53
Range 61 S shows a fill of	4.38

From November 16, 1883, to June 6, 1884:

Range 64 A shows a scour of	2.3
Range 65 A shows a fill of	22

At the upper end of the chute the cross-dikes extend from the main dike to the Mississippi shore; while at the lower end the depth of the water is such that the dikes cannot be driven across. The Baleshed Bar has increased both in width and length, its lower extremity being now within 200 meters of the head of Stack Island, with a width of 680 meters on Range 72 (L. P. gauge, 6.05 feet).

STACK ISLAND CHUTE.

Three sections have been selected for comparison ranges, 71 and 72 both extending across the river, and Range 73 in the chute proper.

From February 5 to April 23, 1884, during the rising and high stages, a slight scour of .84 foot took place in the chute; on Range 72, inside the dike, the fill averaged 2.62 feet; on Range 73, an average scour of 10.5 feet took place.

On September 24, 1884, the deepest water found on Range 72 (below the cross-dike) was 0.8 foot, and on Range 73, 47 feet (L. P. gauge, 6 feet).

A tabular statement showing results of comparative surveys is submitted herewith.

MAYERSVILLE ISLAND.

During high water about 1,800 feet of the lower end of the island, consisting of a very narrow strip between the chute and the main river, was washed away.

MISCELLANEOUS.

No low-water survey has yet been made; hence a direct comparison of the reach for the low-water stages of 1883 and 1884 cannot be made at this time.

The progress maps accompanying annual report show all dike and mat work constructed since the beginning of improvements and standing October 1, 1884. Also 6-foot contour lines (L. P. gauge) as they were in December, 1881, before construction work commenced, and in July, 1884.

The maps of comparative sections at Pilcher's Point, Ranges 14, 16, 18, 20, 22, and

24 are taken from surveys of April 5, 1883, September 12, 1883, April 17, 1884, and July 8, 1884. Construction work was begun in this bend about September 1, 1883, and is now in progress.

The sections showing changes in chutes are from surveys of December, 1881, and April and July, 1884, before and after dike construction.

A map of the July general survey on scale of 1:50000 is also submitted herewith.

The steam-launch Nellie was used by the party until she was sunk December 31, 1883, by striking a submerged snag. From January to June, 1884, the tow-boats on the reach were used at various times for soundings and gauging operations. In June, 1884, the steamboat Meter, designed and built for the use of the party, arrived, and has been used constantly ever since, giving entire satisfaction.

In January, 1884, a case of small-pox appeared on the quarter-boat, rendering it necessary to organize a new party, delaying the work nearly three weeks.

To my assistants, Messrs. Ritchie, McNulty, Vansickle, Reed, and Lowegren, I am indebted for valuable and efficient services rendered.

Very respectfully,

E. D. THOMPSON,
United States Assistant Engineer.

ARTHUR HIDER,
United States Assistant Engineer in charge.

H 7.

Summary of discharge observations taken at Wilson's Point, Louisiana, from November 1, 1883, *to October* 1, 1884.

Date.	L. P. gauge.	Area.	Mean velocity per second.	Discharge per second.
1883.		*Square feet.*	*Feet.*	*Cubic feet.*
November 27–28	18.40	173,480.80	4.41870	501,365.7900
December 10	24.35	131,977.60	5.19212	685,244.4500
1884.				
January 30–31	25.30	128,143.40	5.21453	668,204.4600
February 15	34.75	161,923.60	5.48703	888,481.2300
February 26	37.48	173,589.90	5.95205	1,033,216.7200
February 27	37.60	170,769.40	6.08590	1,039,292.3100
February 28	37.66	172,887.76	5.98720	1,035,117.5400
February 29	37.72	178,380.20	5.95440	1,062,144.3800
March 3	37.72	174,284.00	5.93930	1,035,130.0880
March 6	37.87	183,876.00	5.91470	1,087,561.8464
March 11	38.11	185,676.00	6.20020	1,151,230.4776
March 13	38.12	182,880.00	6.13150	1,121,330.9312
March 17	37.86	183,332.00	5.98930	1,098,032.5664
March 19	37.97	183,308.00	5.84690	1,071,788.2326
March 21	38.29	185,504.00	5.52260	1,024,459.3376
March 24	38.39	188,420.00	5.58970	1,053,212.3468
March 26	38.25	186,263.00	5.61120	1,045,166.5943
March 28	38.05	186,464.00	5.47710	1,021,280.2704
April 5	37.06	188,202.00	5.51770	1,038,454.7700
April 12	36.68	189,608.80	5.52580	1,047,741.0140
April 16	36.69	186,570.80	5.70470	1,064,339.3028
April 24	36.72	188,164.80	5.60570	1,054,786.9920
May 3	36.51	192,082.40	5.56440	1,068,829.4100
May 10	36.53	180,430.00	5.60340	1,011,027.3890
May 16	36.33	185,106.80	5.54150	1,025,762.2800
May 27	34.35	178,040.00	5.14002	915,129.8870
June 11	24.50	148,000.00	4.15630	615,139.5110
June 17	24.98	146,201.00	4.38520	641,124.9280
June 23	25.50	150,930.00	4.29950	648,928.1490
June 28	24.39	145,900.00	4.27670	623,964.4580
July 7	21.60	132,720.00	4.26470	566,011.0800
July 22	18.90	132,960.00	4.10940	546,382.5690
August 14	14.95	114,830.00	3.43940	394,946.5560
September 17	7.15	90,710.00	2.97210	269,599.7330

COMPARATIVE SECTIONS.

LOUISIANA BEND—RANGE 18.

Date.	W. S.	L. P. gauge.	Areas below datum.	Scour.	Fill.
1884.			*Square feet.*		
February 4	31.15	24.81	249,560	.....	.....
February 11	37.11	31.55	229,144	.....	20,416
February 13	38.92	33.57	239,880	.....	9,680
February 16	40.50	35.35	228,106.4	.....	21,453.6
February 18	41.30	36.30	250,966.4	1,406.4	.....
February 22	42.65	37.45	247,680	.....	1,880
February 26	43.55	37.49	249,080	.....	480
February 29	43.70	37.72	223,531.2	.....	26,028.8
March 28	43.45	38.06	226,800	.....	22,760
April 17	42.90	36.65	225,976	.....	23,584

LOUISIANA BEND—RANGE 22.

February 4	30.95	24.68	281,632	.....	.....
February 10	35.94	30.80	281,280	.....	352
February 13	38.55	33.54	286,160	4,528	.....
February 16	40.20	35.35	297,200	15,568	.....
February 18	41.00	36.30	299,440	17,808	.....
February 22	42.35	37.43	293,320	11,688	.....
February 26	43.25	37.48	272,208	.....	9,424
February 29	43.40	37.72	259,760	.....	21,872
March 28	43.15	38.05	269,328	.....	12,304
April 17	42.70	36.65	244,087	.....	37,545

DUNCANSBY CHUTE—RANGE 37 S.

Date.	Water surface, Wilson's Point gauge.	Below Dike No. 6.			Width of section.	Average depth of fill below datum.
		Areas below datum.	Scour.	Fill.		
1883.					*Feet.*	*Feet.*
December 3	24.25	44,160	.....	.....	1,680	.....
1884.						
February 4	25.05	41,945	.....	2,215	.....	1.32—
March 13	37.72	34,373	.....	9,787	.....	5.82+
April 8	36.59	33,867	.....	10,293	.....	6.13—
April 17	36.52	31,440	.....	12,720	.....	7.57+
June 5	27.30	26,773	.....	17,387	.....	10.35—

DUNCANSBY CHUTE.—RANGE 41.

Date.	Water surface, Wilson's Point gauge.	1,000 meters below Dike No. 8.			Width of section.	Average depth of fill below datum.
		Areas below datum.	Scour.	Fill.		
1883.					*Feet.*	*Feet.*
November 14	18.15	54,920	.....	.....	2,650	.....
November 23	20.15	55,792	872	.....	.....	.....
December 4	24.85	53,800	.....	1,120	.....	0.42
1884.						
February 4	25.05	54,920	.....	000	.....	.....
March 13	37.72	53,680	.....	1,240	.....	0.47—
April 8	36.59	51,232	.....	3,688	.....	1.39+
April 18	36.52	47,960	.....	6,960	.....	2.63—
June 5	27.30	45,440	.....	9,480	.....	3.57

NOTE.—The first survey on each section is taken as the unit of comparison.

MAYERSVILLE CHUTE—RANGE 52.

Date.	Water surface, Lake Providence gauge.	Areas below datum.	Scour.	Fill.	Width of section.	Average depth of fill below datum.
		Square feet.			*Feet.*	
1883.						
November 14	16.83	26,373	.....	.....	960	.....
November 27	18.03	30,667	4,294	.....	.....	.....
1884.						
February 5	24.50	29,840	3,467	.....	.....	.....
March 10	38.10	28,107	1,734	.....	.....	.....
April 21	36.80	28,480	2,107	.....	.....	.....
May 10	36 52	27,227	854	.....	.....	.....
June 4	28.30	29,413	3,040	.....	.....	.....

MAYERSVILLE CHUTE—RANGE A.

1883.						
November 14	16.83	25,360	.....	.....	870	.....
November 27	18.03	24,134	.....	1,226	.....	1.41
1884.						
February 5	24.50	26,960	1,600	.....	.....	.....
March 10	38.10	26,180	820	.....	.....	.....
April 21	36.80	26,826	1,466	.....	.....	.....
May 10	36.52	28,747	3,387	.....	.....	.....
June 4	28.30	30,160	4,800	.....	.....	.....

MAYERSVILLE CHUTE—RANGE B.

1883.						
November 14	16.83	25,493	.....	.....	895	.....
November 27	18.03	26,934	1,441	.....	.....	.....
1884.						
February 5	24.50	28,374	2,881	.....	.....	.....
March 10	38.10	27,120	1,627	.....	.....	.....
April 21	36.80	26,320	827	.....	.....	.....
May 10	36.52	27,200	1,707	.....	.....	.....
June 4	28.30	27,067	1,574	.....	.....	.....

MAYERSVILLE CHUTE—RANGE 53.

1883.						
November 14	16.83	27,920	.....	.....	996	.....
November 27	18.03	28,254	334	.....	.....	.....
1884.						
February 5	24.50	29,360	1,440	.....	.....	.....
March 10	38.10	28,533	613	.....	.....	.....
April 21	36.80	28,533	613	.....	.....	.....
June 4	28.30	26,747	.....	1,173	.....	1.13

NOTE.—Comparisons are made with the first survey on each section.

BALESHED CHUTE—RANGE 60 S.

Date.	Water surface, Lake Providence gauge.	Inside of dike.			Width of section inside dike.	Average depth of fill, inside of dike below datum.
		Areas below datum.	Scour.	Fill.		
		Square feet.			*Feet.*	*Feet.*
1883.						
December 5	24.15	28,027	.....	.....	1,400	.....
1884.						
February 5	24.50	28,040	13	.....	.....	.....
March 14	38.03	24,913	.....	3,114	.....	2.22+
April 24	36.72	22,546	.....	5,481	.....	3.91+
June 6	26.55	21,680	.....	6,347	.....	4.53+

BALESHED CHUTE—RANGE 61 S.

Date.	Water surface, Lake Providence gauge.	Inside of dike.			Width of section inside dike.	Average depth of fill, inside dike below datum.
		Areas below datum.	Scour.	Fill.		
1883.						
December 5	24.15	43,680	.....	.....	1,466	.....
1884.						
February 5	24.50	44,186	506	.....	.....	.....
March 14	38.03	39,233	.....	4,447	.....	3.03+
April 24	36.72	40,480	.....	3,200	.....	2.18+
June 6	26.55	37,253	.....	6,427	.....	4.38+

BALESHED CHUTE—RANGE 64 A.

1883.						
November 16	17.25	41,226	.....	.....	1,688	.....
December 5	24.15	43,040	1,814	.....	.....	.....
1884.						
February 5	24.50	43,973	2,747	.....	.....	.....
March 14	38.03	47,680	6,454	.....	.....	.....
April 24	36.72	54,260	3,034	.....	.....	.....
June 6	26.55	45,120	3,894	.....	.....	.....

NOTE.—Comparisons are made with the first survey on each section.

STACK ISLAND CHUTE—RANGE 71.

Date.	Water surface, Lake Providence gauge.	Area below datum, inside of dike.	Scour.	Fill.	Width of sections.	Average depth of scour below datum.	Average depth of fill below datum.
1884.		*Square feet.*			*Feet.*	*Feet.*	*Feet.*
February 5	24.50	92,160	.....	.....	2,632	.....	.....
February 18	36.30	88,480	.....	3,680	.....	.....	1.39
March 14	37.03	92,936	776	.....	.....	0.29+	.....
April 23	36.80	94,376	2,216	.....	.....	0.84+	.....

STACK ISLAND CHUTE—RANGE 72.

1884.							
February 5	24.50	101,120	.....	.....	2,414	.....	.....
February 18	36.30	90,904	.....	10,216	.....	.....	4.23+
March 14	37.03	101,860	740	.....	.....	3.06+	.....
April 23	36.80	94,816	.....	6,304	.....	.....	2.61+

RANGE 73 CHUTE.

1884.							
February 5	24.50	81,600	.....	.....	1,721	.....	.....
February 18	36.30	85,173	3,573	.....	.....	2.08—	.....
March 14	37.03	92,640	11,040	.....	.....	6.41+	.....
April 23	36.80	99,840	18,240	.....	.....	10.59+	.....

NOTE.—Comparisons are made with the first survey on each section.

H 8.

REPORT OF HENRY STEUBING, ASSISTANT ENGINEER, UPON COST OF UNLOADING AND DISTRIBUTING STONE ON LAKE PROVIDENCE REACH.

WILSON'S POINT, *October* 1, 1884.

SIR: The following is the amount and cost of unloading stone from barges at Wilson's Point, covering revetment of Mayersville Island with stone, and foot-mat work on Stack Island and Baleshed dikes, done by the party under my charge:

4,813 cubic yards stone unloaded from barges, at 25 cents	$1,203 75
5,480 cubic yards stone distributed on revetment, Island 93, at 50 cents	2,792 00
2,525 squares revetment built, repair to revetment, Island 93, at 57 cents	143 92
414 squares foot-mat constructed, Stack Island, Baleshed dikes, at $2	828 00
330 cubic yards of grading, at 30 cents	99 00
101 squares shore revetment, Stack Island dikes	46 18
	5,112 85
Amount of pay-roll	3,858 45
Amount of subsistence	1,254 40
	5,112 85

The party was turned over to Assistant Engineer Tollinger August 1, having been assigned to duty at Pilcher's Point.

Respectfully submitted.

HENRY STEUBING,
Assistant Engineer.

ARTHUR HIDER,
United States Assistant Engineer in charge.

H 9.

REPORT OF H. ST. L. COPPÉE, ASSISTANT ENGINEER, UPON WORK AT DELTA POINT, LA., AND VICKSBURG HARBOR.

VICKSBURG, MISS., *October* 10, 1884.

CAPTAIN: I have the honor, in accordance with instructions mailed me on the 20th ultimo, to submit the following annual report of work under my charge. You instruct me to report on the work up to the 1st of October, but as it will only take to the 10th to finish all the construction that will be needed at this point for some time, I have included these 10 days.

At the time of the last annual report a survey had been made, and the results recorded therein.

Delta Point was in most part intact and but little repairs necessary. The inner harbor had filled to such an extent that, in spite of the money expended in dredging, Captain Marshall would recommend no continuation of the work there, nor submit any further estimate for improvement.

At that time Delta Point was unsettled, as shown in sketch, the only weak part being at the projecting mud point, where mattress dike was built 2,000 feet below Delta Wharf-boat Landing. It was estimated that 500 linear feet of mattress would repair this.

January 1, with an outfit from Wilson's Point, I commenced the construction of a mattress here to be of the length estimated, but the weather was so severe, and the water at such a high stage, that no attempt was made otherwise than to temporarily prevent the caving until a more favorable time; this was accompanied with some difficulty (by sinking a mat 183 by 163 feet, as shown in sketch).

January 16, all the plant taken from the Lake Providence Reach was returned and no more work done on the harbor until the present low-water season.

In the latter part of June you directed me to make a survey of the harbor and Mississippi River in the vicinity, with a view to comparing the results with those obtained in former years, and also for the purpose of ascertaining the condition of the work already done, and the repairs and new work necessary in order to carry out the general plan of improvement.

July 10, after making the survey I sent to your office at Memphis a report on the same, accompanied by maps and estimate. The following extract from it will show the condition of the river and changes then made:

"The changes that have occurred since the last survey, made October of last year, in the main river, as can be seen by studying the map, are as follows:

"The sand-bar above Delta Point has caved, becoming what is termed a bluff-bar, the low-water line being forced towards the Louisiana side 200 feet. The tail of the bar has been moving down-stream each year, showing it to be some hundred feet below the position occupied the year previous. Now the change at the lower end is almost imperceptible. The change at King's Point is also but slight. From immediately at the point just above the line of the old river bank (see map) for 2,000 feet the caving has been about 50 feet, but above and below the interval there has been no change. The soundings in the vicinity of Delta Point, where the bank was revetted, show a slight diminution in depth, due, I think, more to high-water influences than any other cause; a few weeks of low water will deepen the water here again. The bar below King's Point, through which West Pass was cut, and which closes the entrance to the Centennial Lake, has been partially swept away, the low-water line being to some extent forced back towards the old channel of the river (northeast). All the sand which originally formed this middle ground or outer bar has not been effectually caved away, but seems to have moved in part just below its former position, shoaling up slightly the river in the vicinity of the P. line elevator; making an average difference at the lower landing of 8 feet since last year. Just below the last or lowest mattress placed at Delta Point (on the sand-bar) the bank has caved to the extent of 100 feet at a point 600 feet below old work, and 150 feet 1,200 feet below old work. Delta Point proper, where mattresses were placed in 1882 and 1883, is unchanged, with the exception of one or two points where there has been considerable deposit. About 1,200 feet below the P. line elevator on the Mississippi side, the bank commences to cave, increasing as you go down-stream, being very destructive at the Refuge Oil Mill, 1 mile below. At this point it has caved, since August 1882, 800 feet, being now within 66 feet of the track of the L., N. O. and T. R. R., and threatening the site of the mill.

"The soundings in the inner harbor show the changes to be but slight, and different from what had taken place in former years, there being a scour from Glass Bayou to Ryan's upper mill of about 1 foot—in the north end of the lake, the difference, if any, being less. Below the upper mill there is a fill in the line of the old proposed canal bed of channel, varying from 0 to 2 feet.

"On a line called section 1 in the channel near the river side there has been practically no change; on the same line, opposite Point of Willows, the fill has been as great as 4 feet, and half way to West Pass 6 feet. At West Pass the difference is but 1 foot; here the deposit is soft mud.

"To recapitulate, the tendency seems to have been for the river to approach nearer its old bed, cutting away the sand-bar above Delta Point, which commenced to form just after the cut-off in 1876 (and had up to this year been gradually creeping down-stream), turning the thread of the current once more towards the west entrance to the Lake Centennial and sweeping away the middle bar, which last year projected out in the river some distance, as shown on the map."

As stated in that report, I am of the opinion that this more favorable condition of things was entirely, or in great part at least, due to the fact that Delta Point remained immovable; after two years of constant endeavor to wash it away, the river had been forced back towards the old channel.

In the same report I submitted estimates for improvement for the present season, as follows:

Excavating canal basin and West Pass to zero of gauge:	
Basin: Natural slope on city side and slope 8 to 1 on other side	$26,708 10
Canal: Slopes same as basin	13,890 15
West Pass: Slopes 3 to 1	16,958 55
Total	56,556 80
Revetting Delta Point	25,000 00

August 1 there was on hand of funds belonging to this appropriation $1,723.32, and an allotment which had just been allowed by the Commission for improvement of Delta Point, $25,000, making a total of $26,723.32 with which to patch up the breaks (which were developing on the receding of the water) and further revet the Point at the lower end.

August 2 an outfit arrived here from Wilson's Point, with which work was commenced, which consisted, as in former years, in grading the bank, sinking mattresses, and building revetments for upper bank protection. This work has been carried on up to date, with the result shown on the accompanying map.

At first it was proposed to use $22,500 of the $25,000 allotted, in revetting 1,500

feet of the bank below the old work, and the balance of the $25,000 in patching at the upper end of the Point; but on the receding water, as before stated, so many new breaks were uncovered that it was found necessary to take much more of the appropriation for patching than was at first deemed expedient.

The work was commenced by building a mattress at the upper end of the revetment laid in 1882, where the water is extremely swift and the bank was being undermined by the action of the current. Here, in all, about 700 linear feet of mattress was sunk, and the bank graded, and about 460 linear feet of bank revetted; at the lower end of the point (see map) 800 linear feet of mattress was sunk, and 1,040 linear feet of bank graded and revetted; in all, about 1,500 feet of bank protected with willow and stone. The upper work is about 200 feet wide from top of bank to outside edge of mat, the lower being nearly 300 feet. At first the grading was done by hand, but this was found to be so expensive that you sent me a hydraulic grader, which proved, as in 1882, an enormous saving of expense. In addition to this work, I requested permission, while the grader was here, to make an attempt with her to open West Pass, in order that I might get stone from the quarries at Vicksburg for use on the work, also for the benefit of small boats that might enter the inner harbor.

On your granting the request, I placed the grader at the river end of the pass, and with great difficulty worked her through to the lake, making 8 feet of water as she moved, which shoaled up at once to less than 2. In the same way I forced her back to deep water in the river. It took ten days to do the work, and cost $400 for labor, subsistence, and coal, and a day after leaving the pass it was in a worse condition than before commencing the work. The material through pretty much its entire length is compact sand, which shifts continually, at one time being 10 inches below the water surface, and the next day in the same spot 50 inches.

At about the time of finishing the grading at Delta Point it was found to be necessary to move the Vicksburg wharf-boat below its former site to deeper water and where the bank was almost perpendicular. I was requested to grade this bank for the city, the latter paying the expense of running the grader, which I did, after receiving permission from you.

I have had no time or means for making a general survey of the harbor, but have made a detailed reconnaissance; have had a meander line run from the foot of Delta Point to opposite the sand-bar at the mouth of Yazoo, locating the latter, and sections sounded along the Louisiana side where mattresses have been sunk. My reconnaissance serves to show that the conditions are but little changed since the last survey.

The West Pass at the present time (there being a considerable rise in the river) is quite deep, over six feet throughout its entire length, and 95 feet wide, the water passing through it with great velocity into the lake. The basin dredged in front of the city in 1883 is in about the same condition as shown in last report. The canal is about the same also, except where citizens have dammed it up to keep water in the lake. The Headlight, a light draught boat, came into the harbor yesterday and is now lying at the foot of Clay street.

There is no caving at the present stage of water from the mouth of the Yazoo to below the Refuge Oil Mill on the Mississippi side, and none on the Louisiana side from Young's to three miles below Delta (town).

The channel of the river is a little deeper or rather at a greater depth below low water than when the river was at a higher stage. It will be seen by the map that Young's Point is being caved away and the bar above Delta Point forced back towards the old shore-line. Unless some unforeseen changes take place at the mouth of the Yazoo (where a small cut-off is being made), I think the river will undoubtedly accommodate itself to the old bank in the Louisiana side, and consequently cut away the bar closing the entrance to the inner harbor.

My reason for making a reconnaissance to the mouth of the Yazoo was for the purpose of ascertaining whether a dike built (on the bar forming there) to deflect the current onto Young's Point would not be advantageous in helping the river to sweep away the bar just below on the Louisiana side, but I found that the work would be more extensive than at first anticipated and the expenditure greater than the results would warrant.

After the subsiding of the next high water I expect to find this in a great part accomplished without the help of a dike. The next high water will probably destroy some of the old revetment at the mattress dike, and the sipe water on the falling river the work in the eddy just below, but even should this occur I look for no further trouble, but believe the work on the Point has accomplished its purpose. There may be some sinking and breaking of the bank, but no more caving.

I will be more competent to anticipate the changes that will take place after plotting the soundings and levels taken on sections along the revetted bank.

At the time these sections were sounded a diver (with submarine suit) examined the bottom, the latter being placed in the section lines by the engineer. The results of his work I will submit with the profiles of the sections as soon as plotted. A general resumé of this work is as follows:

He commenced at the upper end of the revetment placed in 1882, but from there to near the old mattress dike was able to do but little, the current being so swift and dangerous; from there to where the bank is straight and covered with deposit, *i. e.*, in the eddy, he found the mattresses all holding, but badly broken or bent over projecting ridges and into holes in the uneven bottom; in some places they were standing perpendicular and entangled in old screens sunk in 1881. This is the portion of the work which I reported some time ago as being in a condition almost unexplainable. There has been apparently no caving whatever, but the bank has sunk with its covering of stone and willow, leaving steps, or cracks, in the slope at its top, and midway an almost perpendicular side from which the rock has slid, but it did not disturb the upright position of the pile driven through the head of the mat at a ten-foot stage in 1882.

I consider it all, or in a great part, due to the influence of sipe water, which runs from the bank as the water in the river falls, as I wrote. In answer to my communication at that time, you suggested the use of wooden drains or tiles; these would be effective were it not that the water has no single outlet, but comes from the bank in places on a shelf perhaps 100 feet long and in such a manner as to make it impossible to collect it in order to carry it off. I would have attempted some experiments, but there was no occasion for draining in the new work and it would have been too expensive in the old, it being necessary to take away considerable revetment in order to get at the seepage ledges. The patching which it has been necessary to do this season shows to me very conclusively the practicability of grading the bank to a very long or gentle slope before revetting. Had this been done here in 1882 we would have had much less trouble repairing; probably it would have prevented the necessity of repairs.

The work this year has been carried on with great difficulty and at a greater expense than otherwise because of the excessive heat and my inability to get labor. White laborers will not come to this country so early as August and September, those who do come being unable to stand the heat of the sun. At one time thirty men in a force of 150, all but one foreman and the steward, were sick. Our only alternative is negro labor, which is very unreliable. It will be impossible for me to make any estimate of the cost of the work of the past season, either as a whole or in detail, until my accounts are all in and the work closed, which will not be for a few days.

I submit herewith a sketch of harbor and Mississippi River in the vicinity showing changes, and sketch of bank at Delta Point showing condition of work to date.

I am, very respectfully, yours,

H. ST. L. COPPÉE,
Assistant Engineer.

Capt. C. B. SEARS,
Captain Engineers, U. S. A., Memphis, Tenn.

APPENDIX I.

REPORT OF MAJOR AMOS STICKNEY, CORPS OF ENGINEERS, UPON OPERATIONS IN THE FOURTH DISTRICT.

UNITED STATES ENGINEER OFFICE,
New Orleans, La., October 10, 1884.

SIR: I have the honor to submit the following report for works under my charge executed from funds controlled by the Mississippi River Commission during the time from October 31, 1883, the date of the last annual report, to October 1, 1884. The works under my charge included in the fourth district, Mississippi River, are as follows, viz:

Construction and repair of levees.

Improvement of harbors of Natchez and Vidalia.

Improvement of mouth of Red River and rectification of the mouth of Red River and the Atchafalaya River.

Improvement of harbor of New Orleans, La.

LEVEES.

The levees under construction at the date of last annual report were Shipp's Bayou to Hard Times, Hardscrabble, and Bondurant, Kempe and Green's to Fairview.

Owing to bad management on the part of the contractors, the contracts on the first three of these levees were annulled after every effort had been made to compel the contractors to finish their work. A new contract was made for the Shipp's Bayou

to Hard Times Levee, and the other two were undertaken by hired labor. The disorganization of the work and the excessively rainy season made it impossible to complete the levees in time for the flood. The protection levees at Shipp's Bayou to Hard Times and Kempe were, however, held almost to the top of the flood, the former being finally breached from the rear, after the levees above had broken, and the latter giving way during a violent storm, when the river was at its highest. Along the front of Tensas Parish the flood of 1884 exceeded the height of the great flood of 1882 about 6 inches, and in many places went entirely over the tops of the levees. The result was a great number of breaks in both United States and State levees.

Below Red River no United States levees were breached, but some disastrous breaks occurred in State levees. As the flood developed in magnitude allotments were made by the Commission for protecting the levee lines. A great deal of work was done, and a great many threatened breaks prevented. For details concerning levee work I refer you to the report of my assistant, Mr. H. S. Douglas, who, with all others connected with the work, rendered efficient service in a desperate struggle to maintain the lines. From the last appropriation of Congress, made in act approved July 5, 1884, the amount of $160,000 was allotted by the Commission, to be distributed by the Board of Engineer Officers on construction or repairs of levees. The portion of this assigned to the fourth district was $90,000, to be expended on the United States levees on Tensas Front. It is hoped with this amount to repair the United States levees so they will stand even a great flood, but the amount is not sufficient to put them in a condition of perfect safety with regard to height and stable slopes. The estimate of the cost for completing the line of levees in the fourth district will depend largely upon the dimensions of these embankments. The policy of the Commission heretofore has been to build the greatest length of lines with the money available, without attempting to increase the heights above those parts of the line that were standing. The dimensions of the levees as they now exist are undoubtedly entirely too small for security in times of great floods. The gaps in the levees in the fourth district which will remain open after the construction of the levees now provided for are as follows:

Name of gap.	Length in feet.	Estimated cubic yards.	Estimated price per cubic yard.	Estimated cost.
TENSAS FRONT.				
Diamond Bend to New Carthage	50,000	410,000	$0 30	$123,000 00
Bongere Crevasse	23,400	637,000	30	191,100 00
Black Hawk to Red River	90,000	500,000	30	150,000 00
ATCHAFALAYA FRONT.				
Morganza	6,000	300,000	30	90,000 00
Total	169,400	1,847,000	.....	554,100 00

NOTE.—The height of these levees, as estimated, equals grade of adjacent existing levees.

The following is the report of Mr. H. S. Douglas, who has special supervision of levee work:

"CONSTRUCTION AND REPAIR OF LEVEES AND SURVEY OF UNLEVEED FRONTS.

"UNITED STATES ENGINEER OFFICE,
"*New Orleans, La., October* 1, 1884.

"SIR: I have the honor to submit the following report on 'construction and repair of levees,' and the 'survey of unleveed fronts,' from October 31, 1883, to October 1, 1884:

"During the period a most extraordinary and disastrous flood ha soccurred in the Mississippi River. The levees, both State and United States, have been severely tried, and in many cases were found inadequate to restrain the flood. Numerous breaks occurred, and others were only prevented by extraordinary efforts. During the flood, authority having been given, work was undertaken for the preservation of both State and United States levees. Large quantities of material were furnished and work done for this purpose, principally upon State levees, which were frequently found lacking in cross-section, crown, and height. It is gratifying to note that breaks occurred in but two completed United States levees.

"On October 31, 1883, six of the eleven levees on which contracts had been let had been completed and received, and of the remaining five two have been completed and

received to date. The non-completion of the three remaining levees is attributable to the failure of contractors to place adequate forces upon their works, to the early rise of the river, and to a very unfavorable working season.

"The following gives progress on each levee in detail, and its present condition:

"TENSAS FRONT.

"Castleman's to Buck Ridge, near Point Pleasant. This levee was completed under contract prior to October 31, 1883. On March 15, 1884, the river had risen to 45.95 on the Vicksburg gauge, 2.8 feet below the high water of 1882, and at that time the levee was reported by residents of the locality to be safe, they anticipating danger only from the waters going over the tops of the old levees at certain low points. The river continued steadily to rise, however, and on the night of March 20 the first break occurred.

"Between the 20th and 23d fifteen breaks occurred in the State and United States levees at this point, eleven being in the new Government work. The flood went over the tops of nearly all the levees in this locality, and the new work, not being as well grassed and settled as the old, suffered the most.

"The breaks have all been surveyed and staked out since the decline of the flood. It is estimated that 22,000 cubic yards of earth will be required to close the breaks, and under the recent allotment for construction and repair of levees this work was advertised and bids for it opened September 27, 1884.

"SHIPP'S BAYOU TO HARD TIMES.

"Work was in progress on this levee October 31, 1883, under contract. Slow progress was made, and though the contractor was repeatedly directed to increase his force and push his work, he failed to do so. Finally, on December 8, 1883, the contract was annulled and authority given to complete the work by open purchase and hired labor or contract. Some difficulty was experienced in getting a contractor who would undertake the work, on account of the lateness of the season, but finally a contract was made to complete the levee by February 1, 1884. Work was commenced under the new contract December 15, 1882, and pushed with great energy, though with inadequate force. Heavy and constant rains interfered materially with the progress of the work, and the time for completion was first extended to February 20, and afterwards to March 15, 1884.

"A portion of the embankment across the bed of Lake Saint Joseph continued to sink almost as rapidly as the earth was placed on it. Earth became difficult to procure, and had to be hauled or wheeled long distances.

"In addition to this, the levee commenced to slough badly at several points, so that it was impossible to keep it up to grade or put the bank in proper shape. The rains filled up the swamps, rendering it impossible to obtain earth to complete these sloughing places. As by a clause in the contract the United States agreed to furnish the contractor with workable earth, and this being impossible at the time, it was thought best for the interest of the Government to receive the work and make final settlement with contractor, which was done. Previous to this, when it became almost certain that the main line could not be completed, it was decided to endeavor to hold the old front line of levee, which, with the work done to keep out the high water of 1883, was in fair condition. The line of protection was nearly 2 miles in length, and on this line a hard fight was made against the rising river. The force was worked night and day, and the protection levee was raised, strengthened, and revetted with sacks and lumber. Two decked barges were obtained from Captain Marshall, and earth boated long distances. On March 15 the river had risen to 45.95 on the Vicksburg gauge, and an additional rise of not to exceed 18 inches was expected from the 'Yazoo wave.' The protection levee was raised and strengthened to meet this rise, which instead of 18 inches amounted to 3 feet, the crest of the wave being about 6 inches above the high water of 1882 at Hard Times.

"On March 20 the situation became desperate, as the river was brimming over the protection levee for 2 miles. On the night of the 20th breaks occurred in the levees above, causing a temporary fall of about 2 inches at Hard Times. The water pouring in through the breaks above inundated the country, and, owing to the peculiar topographical features of the locality, backed up against the land side of the new main levee, and on March 21 broke and washed it away for 200 feet. The river continued to rise, and eventually overtopped the protection levee, breaking it and the main line at numerous points. A survey of the levee has been made and the various gaps staked out. It is estimated that 40,000 cubic yards of earth will be required to close the gaps and complete the line. Under the recent allotment bids have been asked for to do this work and were opened September 27, 1884.

"HARDSCRABBLE AND BONDURANT.

"Work on this levee under contract was in progress October 31, 1883. The contractor failed to prosecute his work with due diligence, and there being no prospect of the work being completed in a reasonable time, the annulment of the contract was recommended and approved January 4, 1884. Authority was given to complete the work by hired labor and open contract. The lateness of the season and the amount of work to be done made the prospect for completion rather uncertain. In order to expedite matters and prevent even a temporary stoppage, the force engaged by the contractor was continued on the work.

"The contractor's camps and outfit having been seized by his creditors, permission was obtained from the legal custodian to occupy the camps and use the outfit. The construction of new camps was commenced and additional tools purchased. The progress of the work was greatly delayed by exceptionally bad weather, heavy rains alternating with severe cold snaps. The Hardscrabble Swamp was flooded and rendered almost impassable. From January 5 to 18 there were eleven days of continuous rain. Under the most extraordinary difficulties camps or quarters capable of accommodating 650 men were built, also master laborers' quarters, kitchen, bake-house and oven, warehouse, and office.

"The road being impassable, a wooden tramway about 4,000 feet long was built from the steamboat landing to the new camps for the transportation of material and supplies. Previous to the annulment of this contract permission had been given the contractor to employ convict labor, and he had employed about 250 of these hands. The requisite authority having been obtained, they were continued upon the work, as it would have been difficult, if not impossible, to have replaced this organized force, who had their own quarters and tools. The free-labor force averaged about 400 men per day, and, considering the suddenness with which the work was undertaken, they were organized and handled to great advantage. On February 11 the men demanded an increase of wages and quit work. On February 13 their demands were acceded to and work was resumed, though with a slightly diminished force. On the day of the strike, February 11, the river was nearly over its banks and was rising rapidly. A light protection levee had been built immediately in front of the main line. On February 14 the river rose over the bank in the Hardscrabble Swamp, and after a hard fight broke the protection levee and ran through a gap of about 1,200 feet in the main line. This flooded the camps and caused a suspension of work. The river continued to rise and eventually overtopped all of the levee that was below grade. The lower end of this levee in the Bondurant field had been completed, but the water being on both sides of it, and being exposed to the washing of waves, a crevasse occurred. Since the decline of the river the bank at this point has caved very rapidly and the levee has gone into the river for a distance of about 2,500 feet. Hardscrabble levee was little damaged by the flood, only two small breaks occurring. It is estimated that 75,000 cubic yards of earth will be required to complete Hardscrabble. An entirely new line of levee, estimated to contain 35,500 cubic yards, will be required in the Bondurant field. Under the recent allotment proposals for the construction of each of these levees have been advertised for and were opened September 27, 1884.

"KEMPE BREAKS AND EXTENSION.

"Work on this levee under contract was in progress October 31, 1883. The contractor failed to prosecute his work with due diligence, and there being no prospect of the work being completed in a reasonable time. the annulment of the contract was recommended and approved January 6, 1884. Authority was given to complete the work by hired labor and open contract. For the same reason, as at Hardscrabble, the contractor's force was continued on the work. The contractor's creditors seized his camps and outfit, and permission to use them was obtained from the legal custodian. The same causes that delayed the progress of the work at Hardscrabble prevailed here, only the locality being better drained, the damage was not so great. New camps or quarters capable of accommodating 600 men were built; also an office, warehouse, bake-house and oven, and kitchen. A wooden tramway about 4,000 feet long from the steamboat landing to the new camps was constructed. To facilitate the transfer of supplies and to place Hardscrabble and Kempe in close communication, as was necessary, a steam-tug was transferred from the work of improving harbor at New Orleans, and a small barge chartered. The portion of Kempe levee built by hired labor is probably the heaviest embankment of the kind in the State of Louisiana, considering its length. At one point the line of the embank ment crosses a slough, and for about 1,200 feet it was impossible to procure earth, as the ground was covered by water from 2 to 3 feet deep. In order to procure material for the construction of the main line at this point, it was found necessary to build two side levees across the slough about 500 feet on either side of the main line and parallel to it. Two steam

pumping engines were procured and placed in position. One of them proved to be defective, but the other did good work, and the area between the side and main levee on the land side was soon pumped dry.

"Earth could then be obtained and men were put to work wheeling it into the levee. At the end of February the whole line of the Government work on this levee was well on towards completion, except the 1,200 feet in the slough. Meanwhile the river had risen to an alarming height, and the seepage water came in so rapidly that it was impossible to procure earth on the river side of the new levee. The Kempe protection levee, which had withstood the high water of 1883, was still in good condition, but on February 27 a force was put to work raising it as a matter of precaution. On March 11 the backwater coming down from the break at Hardscrabble flooded the new camps and the levee line, compelling a stoppage of work upon the main levee. The major portion of the force was paid off and about 100 men retained to work upon the protection levee. No danger was anticipated until Sunday, March 23. A heavy rain commenced in the morning and continued throughout the day, but a force of over 100 men was kept at work placing sacks and earth. The incessant rain finally caused the embankment to commence sloughing at several places, and at 1 p. m. an unexpected slough occurred, and notwithstanding every effort the river broke through. The tremendous current destroyed any work done to protect the ends of the break, which rapidly enlarged. Earth had been taken from the new main levee, all other available localities being covered with water, to assist in holding the protection levee. The water from the crevasse rushed over the main line at this point, washing it away and causing a break of about 800 feet in width. This did not add to the volume of water escaping from the river, as the new levee was incomplete at several points. A 'run-around' or new line of levee has been staked off to close this break, estimated to contain 25,000 cubic yards. Under the recent allotment, proposals for building this piece of levee at the crevasse have been advertised for, and were opened September 27, 1884. The balance of Kempe Levee, estimated to contain about 63,000 cubic yards, it is proposed to build by hired labor, and all preparations for the commencement of embankment construction have been made.

"LAKE CONCORDIA BREAKS.

"This long line of generally light embankment was completed by contract prior to the high water of 1883, which it stood without showing signs of weakness. It was reported to be in a dangerous condition at several points on March 14. The levee is composed of a loose, sandy soil, and is in many places exposed to the wash of the lake waves during high water. Measures were taken to protect the levee, lumber and sacks being used without stint. Notwithstanding every effort, however, eleven breaks occurred between March 23 and 26. The ends of these breaks were protected as far as possible to prevent further enlargement. The work necessary to close these breaks has been staked out, and it is estimated that 31,000 cubic yards of earth will be required for this purpose. Under the recent allotment proposals for this work were advertised for, and were opened September 27, 1884. Should there be any surplus funds from this allotment, it is intended to apply them, so far as they will go, to raising the grade of this levee, the work being rendered necessary owing to the elevation of the flood line, caused by the King's Point Cut-off above.

"GREEN'S TO FAIRVIEW.

"Work on this levee, under contract, continued without interruption or incident, and it was finally completed and accepted March 7, 1884. It was not damaged by the high water of 1884, although some work was required to prevent sloughing. It is now in good condition.

"ATCHAFALAYA FRONT (ATCHAFALAYA RIVER TO RED RIVER LANDING.)

"Some trouble was experienced with the contractor on this levee, he refusing to fill out certain shortages in the embankment. Finally he did the necessary work, and the levee was completed, and accepted December 31, 1883. With the exception of two sloughing places, the levee is in good condition. It is proposed to repair these two places by hired labor, the work being too small to do by contract.

"HOG POINT TO RACCOURCI (OLD RIVER).

"This levee was completed under contract prior to October 31, 1883. It is in good condition and requires no work.

"RACCOURCI CREVASSE.

"The levee was completed under contract prior to October 31, 1883, but during the high water of 1884 it showed signs of weakness, and required considerable work. A bad crayfish hole has developed, and it has proposed to cut this out, and make such other repairs as may seem necessary, by hired labor.

"STEWART'S CREVASSE.

"The levee was completed under contract prior to October 31, 1883. It is in good condition and requires no work.

"POINT COUPEE CREVASSE.

"This levee was completed under contract prior to October 31, 1883. A certain portion of the embankment across the bed of an old lake had been sinking. When the levee was received the sinking had apparently ceased, but upon the decline of the river after the high water of 1883 it recommenced, and in February, 1884, it was found necessary to do some additional work at this point to keep the levee up to grade; 13.4 cubic yards of earth were placed on the embankment, and up to date no further settling has taken place.

"SURVEY OF UNLEVEED FRONTS.

"A party under the charge of an assistant engineer was sent into the field in the latter part of November, 1883, to survey a line from Black Hawk Landing to Red River. The progress of the party was unusually slow, and the work was not completed until late in January, 1884. A preliminary line for a levee was surveyed and staked off for a distance of about 17 miles. The results of the survey indicate that a line of levee can be built with less cubical contents, and consequent cost, than had previously been supposed.

"CUT-OFF AT KING'S POINT.

"On May 11, 1884, the river made a new channel for itself across the above point. The cut-off is located on the Tensas front, about 4 miles below the town of Waterproof, and half a mile above L'Argent Landing, and shortens the river distance between those points about 12 miles. A ditch was cut across the point about the year 1855, and at every high water since that time the river flowed across the point through this ditch. The first indications of the river cutting its way through were observed on May 7 and 8, when the banks on both sides commenced caving rapidly, and by May 11 the cut-off was made. The ditch before the cut-off is said to have been about 50 feet in width by 20 feet deep. It is now the main channel of the river. The following table of gauge records shows the effect of the cut-off on the river at Kempe Levee, 10 miles above; at Waterproof, 4 miles above; and at Natchez, 21½ miles below. It is to be regretted that no gauge record is attainable at any point nearer to the foot of the cut-off than Natchez. The river was nearly stationary just before the cut-off.

Gauge records.

Date.	Kempe levee.	Water Proof, Louisiana.	Natchez, Mississippi.
1884.			
May 7	5.25	.....	44.90
8	5.21	.....	44.90
9	5.25	.....	44.85
10	5.21	.....	44.85
11	5.05	.....	44.90
12	4.95	3 in fall	44.95
13	4.75	2 in fall	45.00
14	4.55	2¾ in fall	45.05
15	4.40	2½ in fall	45.10
16	4.10	2 in fall	45.10
17	*4.05	*1¾ in fall	*45.10
18	4.10	2½ in fall	45.15
19	3.85	1½ in fall	45.15
20	3.75	1½ in fall	45.10
21	3.75	1½ in fall	45.10
22	3.55	1 in fall	45.05
23	*3.60	*½ in fall	*45.10

* Heavy rain on May 17 and 23.

"It is greatly to be feared that the already rapid caving in the Kempe Bend will be accelerated, though the flood-line will be lowered. The last practicable line of levee has been built between the river and Lake Saint John at Gibson's Landing, below the cut-off. It is highly probable that one of the results of the cut-off will be to destroy this levee, in which case a long line of embankment will have to be built on the west bank of Lake Saint John, as has been done at Lake Concordia. The grade of the United States Lake Concordia Levee will have to be raised, as even before the cut-off the flood of 1884 proved it to be too low.

"PROTECTION AND PRESERVATION OF LEVEES, STATE AND UNITED STATES, DURING THE FLOOD OF 1884.

"On March 20, 1884, authority was given to do work on both State and United States levees on the Tensas Gront, with a view to prevent further breaks. The following will give a general idea of the amount of work done: At Ashwood Levee (State), on Lake Palmyra, a great deal of work was done. From this point to Shipp's Bayou no work was done, as the levees were generally overtopped by the flood. Earth was boated long distances, and every effort made to hold Shipp's Bayou Levee (State). The report on Shipp's Bayou to Hard Times Levee describes the work at that point. From Hard Times to Bondurant's no protection work was undertaken, as the country inside the levees was deeply inundated from the Hardscrabble break, and several of the levees were overtopped by the flood. Between Bondurant and Kempe work was done on the Bruen's Bayon Levee and on the Lee Levee to prevent breaks. The work was successful, as no breaks occurred on this stretch. The history of the protection work at the United States Kempe Levee is given in the detailed report on that levee.

"Considerable work was done on State levees between Kempe and Lake Concordia, principally upon the L'Argent Levee. It showed great signs of weakness, and being composed of sand was washed badly by the waves. It was revetted and strengthened with lumber and sacks. Constant work alone saved this levee. The protection work on Lake Concordia is given in the report on that levee. From Lake Concordia to Red River work was done on State levees and on United States Green's to Fairview Levee at various points. On the Henderson-Ashley Levee (State) considerable work was done raising the embankment, which would have been overtopped by the flood.

"On March 26 the steamboat H. J. Dickey was chartered for the purpose of distributing material for the protection of the levees. She was loaded with 120,000 feet of lumber, 50,000 empty sacks, 120 wheelbarrows, and the same number of shovels. An assistant engineer was placed in charge, with directions to distribute material at threatened points between Point Coupee Levee and the head of the district.

"The limits of the protection were extended down-stream, first to a point 50 miles below Red River, and afterwards to the town of Plaquemine. Additional allotments of funds were made from time to time by the Commission for the purpose of protection. Assistant engineers were sent out and given charge of special districts. The work necessary for the protection of levees was done under their direction. It was at first expected that if the United States furnished the material the inhabitants would gladly furnish the labor, but in almost every case the Government both furnished the material and paid the labor. The Dickey distributed material from the head of Profit Island to Lehman's Store at the upper end of Green's to Fairview Levee. From the head of the Atchafalaya to Hog Point work was done at various points to prevent wash of waves and sloughing of embankment on the United States Levee. From Hog Point to Williamsport, on Raccourci Old River, no work was necessary, as the new United States levee was in good condition. From Williamsport around Raccomci Old River, and thence to Morganza, a great deal of work was done on State levees, which was badly riddled by cray-fish, lacking in crown, cross-section, and height. The United States Raccourci Levee in this stretch required a run-around to be built on account of a bad cray-fish hole.

"The new Bourgeois Levee (State) required a great deal of work, raising, reveting, and strengthening on the rear slope. The Ahren Levee (State), just above Morganza, required considerable work of the same kind. This stretch required additional work in June, when an additional rise out of the Red River again put the Mississippi up to dangerous height. Two crevasses occurred between Williamsport and the United States Raccourci Levee before the Government commenced work. From Morganza to Point Coupee Landing work was done on State levees, raising, revetting, and strengthening. The O'Malley Levee (State), immediately below Point Coupee Landing, had to be raised and revetted, and the rear slope being very soft, required constant watching. The United States Point Coupee Levee, commonly known as "Scott," remained in splendid condition, except at two points where some work was necessary to prevent sloughing. From Point Coupee to Waterloo the State levees required raising, reveting, and strengthening, which was done. At the Waterloo Crevasse considerable work was done to prevent further enlargement of the crevasse by protecting the ends of the levee. From Waterloo to Hermitage work was required

on the Grand Bay Levee in April, and again in June, as it was in a very threatening condition. From Hermitage to the head of Profit Island the State levees were in a dangerous condition and required considerable work in April and again in June. In the latter month a crevasse occurred just below Hermitage, but it was closed, the United States furnishing the material. When the protection work was extended to Plaquemine an assistant engineer was sent out to attend to any work that might be necessary. This was in the latter part of April, and at that time the river had fallen so that no work was necessary. In June, however, when the river again rose, some work was done. As indicating the amount of work it may be stated that over 275,000 feet of lumber and 100,000 sacks were used on protection work only. In addition to actual labor on some of the levees, watchmen were put on day and night to given timely notice of any danger, and to prevent malicious persons from cutting the levees. The work accomplished has been of the greatest benefit, for without it the number of crevasses would undoubtedly have been greatly increased, and the cost of new levees to close them far exceeded the cost of the protection work.

"SURVEYS.

"The usual monthly estimates have been taken up for payment of contractors. Surveys of the actual condition of Shipp's Bayou to Hard Times, Hardscrabble and Bondurant, and Kempe levees, at the time of the annulments of the contracts, have been made. Work necessary for the closure of breaks in United States levees have been staked out in the field.

Gauge records from March 7 to April 17, 1884.

Date.	Vicksburg.	Saint Joseph.	Natchez.	Red River Landing.	Baton Rouge.	New Orleans.
March 7	45.40	42.25	.....	42.35	.....	.....
March 8	45.65	42.45	44.60	43.00	33.50	0.42
March 9	.....	42.65	44.60	43.30	35.50	.....
March 10	45.75	42.65	44.65	43.70	33.60	0.66
March 11	45.80	42.65	44.75	44.00	33.90	0.50
March 12	45.80	42.90	45.10	44.30	34.40	0.46
March 13	45.95	42.90	45.10	44.50	34.70	0.14
March 14	45.95	43.00	45.15	44.70	34.90	0.08
March 15	45.95	43.00	45.25	44.80	34.95	0.08
March 16	45.95	43.00	.....	44.80	34.70	0.29
March 17	46.00	43.00	45.30	44.80	34.50	0.29
March 18	46.50	43.35	45.80	45.40	35.30	0.00
March 19	47.10	43.80	46.10	45.60	35.28	0.08
March 20	47.85	44.66	46.45	45.80	35.30	0.17
March 21	48.40	44.35	46.85	46.05	35.50	0.06
March 22	48.90	44.40	46.95	46.35	35.70	0.06
March 23	48.85	44.63	47.25	46.65	35.90	0.09
March 24	48.85	44.90	47.40	46.90	36.20	0.00
March 25	49.00	44 86	47.40	47.00	36.00	0.08
March 26	48.80	44.84	47.40	47.10	35.95	0.17
March 27	48.70	44.70	47.30	47.15	36.00	0.17
March 28	48.55	44.52	47.25	47.25	36.00	0.25
March 29	48.40	44.40	47.20	47.30	36.10	0.25
March 30	48.25	44.31	47.15	47.30	36.10	0.25
March 31	48.00	.....	47.10	47.30	36.02	0.42
April 1	47.75	44.31	47.00	47.25	35.90	0.50
April 2	47.55	44.19	46.90	47.20	35.80	0.50
April 3	47.30	44.08	46.70	47.10	35.75	0.66
April 4	47.10	43.88	46.60	47.00	35.70	0.58
April 5	46.90	43.71	46.50	47.05	35.65	0.62
April 6	46.75	43.59	46.45	47.05	35.70	0.42
April 7	46.55	43.40	46 30	46.85	35.45	0.66
April 8	46.40	43.40	46.15	47.70	35.30	1.08
April 9	46.20	43 30	45.90	46 55	35.20	.....
April 10	46.00	43.10	45.75	46.40	35.03	1.00
April 11	45.80	42.90	45.55	46.25	34.95	1.17
April 12	45.70	42.75	45.45	46 20	34.95	1.08
April 13	45.60	42.60	45 35	46.05	34 80	1.08
April 14	45.50	42.50	45.25	45.90	34.60	1.08
April 15	45.50	42.40	45.25	45 80	34.55	1.17
April 16	45.50	42.30	45.10	45.75	34.40	1.25
April 17	45.35	42.20	45.00	45.65	34.35	1.32

REMARKS.

Crevasse at Davis Plantation, right bank, about 22 miles above New Orleans.
Crevasse at Morganza, right bank, between Red River Landing and Baton Rouge.
Crevasse at Belle Air or Mulatto Point, above Baton Rouge.
Crevasse at Point Pleasant, Buck Ridge, Shipp's Bayou to Hard Times, Lower Hard Times, and Bondurant's, between Vicksburg and Saint Joseph; at Kempe and Lake Concordia, between Saint Joseph and Natchez; at Bachelor's, on Raccourci, Old River, between Red River Landing and Baton Rouge.
Crevasse at Waterloo, between Red River Landing and Baton Rouge.
Crevasse at Lacour's, on Raccourci; Old River, between Red River Landing and Baton Rouge.

Extreme high-water readings on gauges.

[On some of these gauges the water was a little higher than here given, the last column being taken from the daily reports.]

Gauges.	1862.	1874.	1882.		1883.		1884.	
	Reading.	Reading.	Date.	Reading.	Date.	Reading.	Date.	Reading.
Vicksburg	51.00	45.70	Mar. 20, 21	48.75	Apr. 7	43.78	Mar. 25	49.00
Saint Joseph	.....	.....	.....	44.50	.....	.....	Mar. 24	44.90
Natchez	50.30	45.58	Mar. 28, 29	47.75	Apr. 7	44.00	Mar. 24–26	47.40
Railroad Landing	.....	47.00	Mar. 27	48.50	Apr. 9	45.20	Mar. 29–31	47.30
Baton Rouge	.....	36.15	Mar. 26	35.95	.....	35.08	Mar. 24	36.20
New Orleans*	0.00	.....	.....	0.42	.....	0.00	Mar. 18, 23, 24.	0.00

*Below high water of 1874. Low water of 1872 = 16.07 on New Orleans gauge.

"The above table of gauge records during the flood of 1884 has been compiled and is of interest. The almost imperceptible effect of crevasses on the gauges is a very marked feature. It will be noted that notwithstanding over sixty crevasses, large and small, between Vicksburg and Natchez, the gauge at the latter point rose with great regularity to maximum high water, and then fell with equal regularity. This may be accounted for by an extraordinary local rainfall over the Big Black Basin, which drains into the Mississippi, principally between the above points. From March 17 to 23 the measured rainfall at Vicksburg was 4.19 inches, and it is claimed that an equal amount fell at Baton Rouge, being general throughout the Big Black Basin. The area of this basin is, according to Humphreys and Abbott, 7,260 square miles. A rough computation, based on the foregoing figures, gives 67,000,000,000 cubic feet of water, less loss by evaporation, absorption, &c., emptied into the Mississippi below Vicksburg on the crest of an extreme flood. Whenever these circumstances recur the result, so far as existing levees are concerned, can readily be surmised.

"In concluding, I would express my obligations to the various assistants which you have assigned to me from time to time, and to the clerical force on those levees being built by hired labor for the energy and industry shown in the discharge of their duties.

"Very respectfully, your obedient servant,

"H. S. DOUGLAS,
"*Assistant Engineer.*

"Maj. AMOS STICKNEY,
"*Corps of Engineers, U. S. A.*"

MONEY STATEMENT.

	Atchafalaya Front.	Tensas Front.
Allotted	$146,000 00	$537,160 00
Drawn	134,000 00	447,160 00
Not drawn	12,000 00	90,000 00
On hand assistant treasurer, New Orleans, September 30, 1884	7,091 60	2,773 37
In hands of assistants	.....	200 00
Expended to September 30, 1884	126,908 40	444,186 63
Balance October 31, 1883	.....	174,529 19
Balance due from appropriation October 31, 1883	2,947 22	.....
Received since	34,000 00	21,000 00
Expended since October 31, 1883	23,961 18	192,555 82
Balance on hand September 30, 1884	7,091 60	2,973 37
Total allotments	146,000 00	537,160 00
Total expenditures	126,908 40	444,186 63

IMPROVEMENT OF MISSISSIPPI RIVER AT NATCHEZ AND VIDALIA, MISSISSIPPI AND LOUISIANA.

No work has been done during the past year, ending October 1, 1884, there being no funds allotted, and the amount expended from the small balance on hand has been for payment of watchmen in care of engineer property and expenses of survey party and office work. Information having reached this office during the latter part of

March that a cut-off was threatened at Cowpens Bend, an assistant engineer was sent to investigate the matter, and reported from information received on the ground, the river at the time being at too high a stage to permit of a close examination, that the banks along Cowpens Bend and below Bullitt's Bayou were caving considerably, but the current across the bend indicated no greater velocity at any one point than another, and that he could see no immediate danger. On the 25th of June, the river having receded within its banks, instructions were given for a survey to ascertain the changes in the bends, and establish points of reference to determine future changes. This survey, compared with the Commission's survey of February, 1883, shows that a very considerable caving has taken place at Palo Alto Point, above Vidalia, permitting the current to strike lower down in the Natchez Bend, and considerable caving in Giles Bend, and very much more in Marengo Bend, below Bullitt's Bayou. The most dangerous feature of these changes is the wearing off of Palo Alto Point and general dropping down of the bend. In letter of September 17, 1884, to the president of the Commission it was recommended that as soon as funds were available the erosion of the point should be checked by the construction of two spur-dikes above the point; work of protection to be afterwards extended up the bend and in Giles Bend, based on the experience gained by the first two dikes, which it is believed will hold the point. These two spur-dikes, it is estimated, can be constructed for $30,000. Spurs for the protection of the banks around the bend can probably be constructed for $10,000 each, and if this system proves as successful as is hoped each spur will protect an average of about 1,000 feet of bank. In some parts of the bends the intervals between spurs would of course be less, depending upon the curvature. The length of bank to be protected is about 16,000 feet in Giles Bend, and about 39,000 feet in Marengo Bend, a total of 55,000 feet, which, at $10 per foot, would require an expenditure of $550,000. To this must be added the cost of plant, which from the experience of New Orleans Harbor would be about $50,000, making a total of $600,000. If it should be found necessary to cover the banks with mattress work, the cost of $18 per linear foot, as originally estimated by Major Benyaurd, is not excessive. The spur system is worth trying, and the plant necessary would be entirely suitable for the mattress system if it were necessary to change.

Approximate estimate of the cost of the work for the protection of the banks above Natchez and Vidalia, $600,000.

MONEY STATEMENT.

Transfer, September 9, 1882	$7,529 09
On hand, assistant treasurer, New Orleans, September 30, 1884	2,672 92
Expended since September 9, 1882	4,856 17
Balance October 31, 1883	5,331 42
Expended since	2,658 50
Balance on hand September 30, 1884	2,672 92
Total appropriated	90,000 00
Total expended	87,327 08

MOUTH OF RED RIVER, LOUISIANA.

The survey of the vicinity of the mouth of Red River, which was in progress at date of last annual report, was continued till January 23, 1884, when the party was withdrawn from the field.

The details of the work are given in report of Assistant Engineer A. O. Wilson, and copies of the maps have been forwarded to the secretary of the Commission.

A project for the rectification of the mouth of Red River and the Atchafalaya River was submitted to the Commission December 15, 1883, as follows:

"PROJECT FOR THE RECTIFICATION OF THE ATCHAFALAYA RIVER AND MOUTH OF RED RIVER.

"UNITED STATES ENGINEER OFFICE,
"*New Orleans, La., December* 15, 1883.

"SIR: I have the honor to present for the consideration of the Commission a project for the rectification of the Atchafalaya River and mouth of Red River.

"This problem is one that has engaged the attention of many engineers, and while a number of plans for its solution have been proposed none has ever been definitely

adopted as meeting all the requirements of the case, or satisfactorily overcoming all of the difficulties.

"Before discussing any plan for improvement it is well to briefly state the condition of the river in this vicinity and the main points to be considered in any plan for so changing these conditions as to permanently overcome all the difficulties.

"The Mississippi River in approaching the mouth of Old River from above has its deep-water channel near the right bank until it arrives within less than a mile of Old River; the channel then crosses quite abruptly to the left bank, which it follows until it has passed Old River, when it again returns to the right bank.

"Between the points of its leaving and returning to the right bank lie the Angola Bar and the mouth of Old River. The first crossing with the consequent bar formation below it is caused partly by the progressive caving of the right bank, as shown at 'A' on the map, but probably also to a great extent by the deposit of sediment consequent upon the escape of water through Old River, and over the banks. As this bar occurs in the concave side of a bend of the river, it would seem as if it might be entirely removed by a proper directing of the current and regularization of the bend shore, and this without danger of reformation if the deposit caused by escaping water was stopped by confining the water. This bar at times is an impediment to navigation and must have some influence in retarding the passage of floods.

"The oscillations of the water surface at Red River Landing are between the low water of 1872, which is 0 on the gauge, and the flood height of 1882, which is 48.50 on the gauge. Owing to the variation of the relative levels of the Mississippi and Red rivers, the water at times passes, from the former towards the Atchafalaya through Old River, sometimes in large quantities, at other times the direction of current is reversed; but each year the flow increases in amount from the Mississippi, and for longer periods of time, caused by the enlargement of the Atchafalaya. The difficulties of the present situation, then, as far as the Mississippi River is concerned, may be briefly stated to be the Angola Bar, and the deflection of the water of the river in ever-increasing quantities down the Atchafalaya, and we might imagine that in a sufficient number of years the bar would grow up to be the left bank of the river, and the Atchafalaya would become the Mississippi.

"Red River after passing Alexandria flows through a channel which has the high land of the Point Maigre Hills on the left and the low ground of the Lamourie swamps on the right, until it reaches the high ground of the Avoyelles prairies on its right bank. Then for a distance of about 9 miles of its course the river flows in a valley between hills which has an average width of about 2 miles. It then turns sharply to the right, and for 10 miles more has the high ground on its right. At this point, near Ware's Landing, the river turns sharply to the left; leaves the high ground, and being joined about 33 miles farther down by the Black, continues till it arrives at its old mouth, in an old bend of the Mississippi River, at a distance of about 9 miles from the latter river. At this point the water has two channels which it may follow, one being to the left of what is now known as Turnbull's Island and called Upper Old River, the other to the right of the island and called Lower Old River.

"At high stages the water flows both ways; but the upper channel is filling up, and at low water none passes in. The water of the Red passing down Lower Old River reaches the head of the Atchafalaya about 3 miles below the head of Turnbull's Island; and here again there are two channels, the Atchafalaya, which receives the greater part of the Red, sometimes all, and the continuation of Lower Old River, which at times carries a part of the Red to the Mississippi, a distance of 6 miles, and sometimes brings water from the Mississippi to the Atchafalaya.

"The right bank of the Red, from Alexandria to a point near the Avoyelles Prairies, is leveed; below that point there are no levees.

"Near this high ground on the right bank a small stream called Choctaw Bayou joins the Red, draining the Lamouril Swamps into the Red when the latter is low, but in flood season taking water from the Red and discharging it into Pearl Lake, from which it escapes southward through bayous and over the low land. Black River, entering the Red from the north, brings in its valley in time of flood, besides its own drainage water, all of the water that escapes from the Mississippi over its right bank as far north as the Arkansas River, with the exception of that which returns to the Mississippi at certain points. The length of Red River from Alexandria to the Atchafalaya is about one hundred and ten miles. The high water of 1882 at Alexandria was 77.8 feet above the zero of the Barbres Landing gauge at the head of the Atchafalaya. The same high water at the latter point was 50.28 feet above the same zero. The high-water slope then was 27.52 feet, or about .25 foot per mile. The low water of 1881 at Alexandria was 29.25 feet above the Barbre's Landing zero. The low water of 1881 at the latter place was 1.2 feet below that zero. The low-water slope then was 40.45 feet, or about .368 foot per mile. In 1881 the water was the lowest and in 1882 the highest ever known. Owing to the variations in the relative levels of the water in the Mississippi and the Red, the slope of the lower part of the Red is subject to violent changes. When the Red is at a comparatively low stage the surface at the head of the Atchafalaya

may vary as much as 12 or 14 feet, and at all stages its surface level depends greatly upon the condition of the Mississippi. The consequence of this is that at times the discharge area of the lower portion, increased by the backing up of the Mississippi, is much greater than at points above, the velocity is sharply checked, and a deposition of sediment must result. This deposition is probably most marked in the vicinity of the mouth of Black River, for up to that point the river is considerably deeper and wider than above. When the Mississippi falls, the slope of lower Red River is increased very considerably, the velocity is greater, and the deposit begins to cut out. Sometimes this increase of slope is so rapid that the cutting out of the deposit does not keep pace with it, and then we have the curious condition noted in Major Benyaurd's annual report for 1882; that is, a slope of only .037 foot to the mile below Black River, and a slope of .8 foot to the mile for the first 8 miles above Black River, the latter slope creating such velocity of current that steamboats could only stem it by using lines fastened to the shore. An examination of the level notes of Major Benyaurd's survey, however, discloses a much greater slope in the first 2 miles above Black River, viz, 2.12 feet to the mile, and as the width of cross-section in these 2 miles varied from 200 to 300 feet, it is probable that at some points a considerably greater slope obtained. In the flood of 1882 the total discharge of Red River escaped over its south bank, the lower end of the river being filled with Mississippi crevasse water. The present difficulties, then, of lower Red River are a continual and sometimes rapid and considerable change of slope and sufficient outlet for its floods, the latter caused by its lower channel being filled with Mississippi crevasse water.

"Lower Old River, the connecting link between the Mississippi and the Atchafalaya and Red, being an old channel of the Mississippi, has a high-water width equal to the Mississippi for most of its length, and from the head of Turnbull Island to the foot has the form of a flattened **S**. From the foot of the island to the Mississippi, a distance of about 1 mile, the channel is nearly straight, with a high-water width of about 800 feet, the remainder of the Old River channel having silted up. Although at times the current through Old River is quite rapid, sometimes in one direction and sometimes in the other, it is often sluggish, and this may occur whether the Mississippi is high or low. When the Mississippi water, above the low stage, enters Old River highly charged with sediment, it immediately loses a great part of its velocity, and drops a large part of its sediment at the mouth. As the water advances beyond the foot of Turnbull Island it spreads out into the wide channel, loses more velocity, and drops more sediment. If the Mississippi is high enough, it spreads over Turnbuil Island, dropping most of its sediment near the banks. The island is then a large bowl, whose rim constantly grows higher, and a considerable part of the flood water remains after the flood subsides, forming ponds which contain water at all times. As the low-water season advances, and the rivers fall, Old River drops into a low-water channel. The deposit at the mouth comes up so near the low-water surface that boats cannot pass unless a channel has been dredged through. The water from the Mississippi passing through the straight reach hugs the island shore, which is the concave side of the bend, for about two miles, when it crosses to the other shore, which then becomes the concave side. The low land lying between the high banks, and which forms the low-water bank on one side, like all banks which are overflowed by sedimentary streams, slopes down from the channel. These low lands, then, have ponds of standing water after the stream has dropped below its low-water banks. The current through Old River makes a well-defined low-water channel, less marked at the crossing, and scours out a considerable part of the high-water deposit. As the water in the river falls, the water in the ponds on either side percolates through the soil and drains into the river. If the river falls slowly it sustains its banks while this draining is in progress, but if it falls rapidly, the drainage water comes under greater head, and the substrata of the banks being converted into a semi-liquid material, and being unsupported by pressure from the river, is squeezed out into the river by the weight of the superincumbent earth. This action is so decided in this vicinity as to entirely dam up the river for hundreds of feet when the conditions are favorable for it, as they were this year.

"The present difficulties in Old River, then, are the bar at the mouth, the sliding banks, and the insufficient low-water channel depth at the crossing.

"The Atchafalaya River, previous to about 1846, was so blocked up with raft material that comparatively little water passed down its channel, and the banks below Simmsport were never overflowed except from backwater. The State of Louisiana undertook the work of removing the raft to make a navigable channel through. From the time that the channel was cleared the river has been steadily enlarging. As the river began to carry the flood-waters of Red River and crevasse water from the Mississippi, its flood surface gradually became higher and higher. At first small levees were built to protect the adjacent country; then larger ones, and finally levee building was given up in despair, and the plantations below a point about 21 miles on the east bank and 30 on the west bank from the head of the Atchafalaya, were abandoned.

"This enlargement of the Atchafalaya is still in progress. In the flood of 1882 the upper part of the river carried nearly one and one-half times the entire flood dis-

charge of Red River, estimating the latter at 200,000 feet per second; since that time the cross-section has still further enlarged both in width and depth. In low water, owing to the great depth, the slope and velocity are exceedingly small, and the extreme low-water surface at the head of the river is but 1.86 feet above Gulf level. The only obstructions to low-water navigation are numerous snags and remains of raft. In flood the slope of the upper part of the river is quite sharp, in 1882 being 60 feet to the mile at the head. Owing to the ragged nature of the banks and bottom, caused by the immense and irregular caving and the sharp bends, the river in flood is full of whirlpools and eddies and sudden changes of direction of current. These not only make navigation extremely dangerous, but diminish the capacity of the channel for discharge. The difficulties to contend with in this river, then, are its constant and rapid enlargement threatening to take a large quantity of the Mississippi River and devastating the country below by its enormous overflows, the lower river being unequal to the discharge, dangerous high-water navigation, and snag obstructed low-water navigation.

"The latter difficulty, however, is not a part of the problem before us, except in such plans as contemplate the passage of that part of the river by the commerce of the Red, Black, and Ouachita.

"Having thus briefly stated the situation and noted the principal features of the problem to be solved, I will note the different plans that have been proposed for its solution, without entering into any extended discussion of them at this time. But before proceeding further it is proper to note another feature of the case, which in former years was a very prominent one. It is the drainage of the crevasse water escaping from the Mississippi in floods all along its right bank from the Arkansas to the Red. In 1882 the maximum escape was estimated to be 500,000 cubic feet per second.

"It entirely filled the Atchafalaya; sent 300,000 feet over country between the Mississippi and Bayou Bœuf, and returned about 100,000 feet to the Mississippi through Old River. The average of this water, which in previous years was a matter of vast importance, is rapidly dropping out of the problem, and in the next year will probably be almost insignificant by reason of the leveeing of the entire Mississippi Front from the Arkansas to the Red.

"The following plans have been proposed:

"(1) To close the Atchafalaya, turning the whole of the Red River with its floods into the Mississippi, and making a connection with the Atchafalaya for its commerce by canal and lock at Plaquemine.

"(2) To separate the Red and Atchafalaya by a low-water dam, turning Red River down upper Old River. This would also necessitate a canal and locks at Plaquemine.

"(3) Close the mouth of Old River, thus making the Atchafalaya a continuation of the Red, opening communication from the Mississippi by canal and lock at Plaquemine. This plan also contemplates, I believe, the building of a levee from Black Hawk to Red River, so as to leave no opening.

"(4) Leaving the rivers as they are and opening a low-water communication by canal and lock at Plaquemine.

"(5) Making a cut from Red River near the mouth of Bayou Cocodrie, about 15 miles above Barbre's Landing, to the Mississippi near Black Hawk, with either a high or low-water dam across the Red below the cut.

"(6) To leave the rivers as they are, and make a low-water connection between the Mississippi and Red by means of a canal and lock at Black Hawk.

"The first plan has been rejected by the Commission as being too dangerous in pouring the floods of the Red into the Mississippi when the latter was at flood height.

"The second plan while necessitating the costly construction of canal and lock at Plaquemine for the commerce of the Atchafalaya, would leave the lower part of the Red subject to even greater variations of slope from the backing up of the Mississippi than is now the case, and would not prevent the loss of water from the Mississippi down the Atchafalaya.

"The third plan would change the route of commerce for the Red, Black, and Ouachita, would necessitate considerable improvement in the Atchafalaya, and would, probably, be the most costly.

"The fourth plan would not prevent the loss of water from the Mississippi down the Atchafalaya.

"The fifth plan would not prevent the loss of water from the Mississippi down the Atchafalaya, and, as stated in Major Benyaurd's report, would make an uncertain connection between the Mississippi and the Red, besides necessitating the Plaquemine lock and canal for connection with the Atchafalaya.

"The sixth plan is subject to the same objections as the fifth, except that the connection between the Mississippi and Red would not be uncertain.

"The plan that I have to present is as follows:

"Divide Red River at the head of Turnbull Island, one branch to be called Red

River, to be conducted through upper Old River to the Mississippi ; the other branch to be called the Atchafalaya, to be conducted down lower Old River into the Atchafalaya. Each of these branches to have an extreme low-water surface width of 400 feet, bottom width of 320 feet, side slope of 1 on 10, depth of 4 feet. As this is to

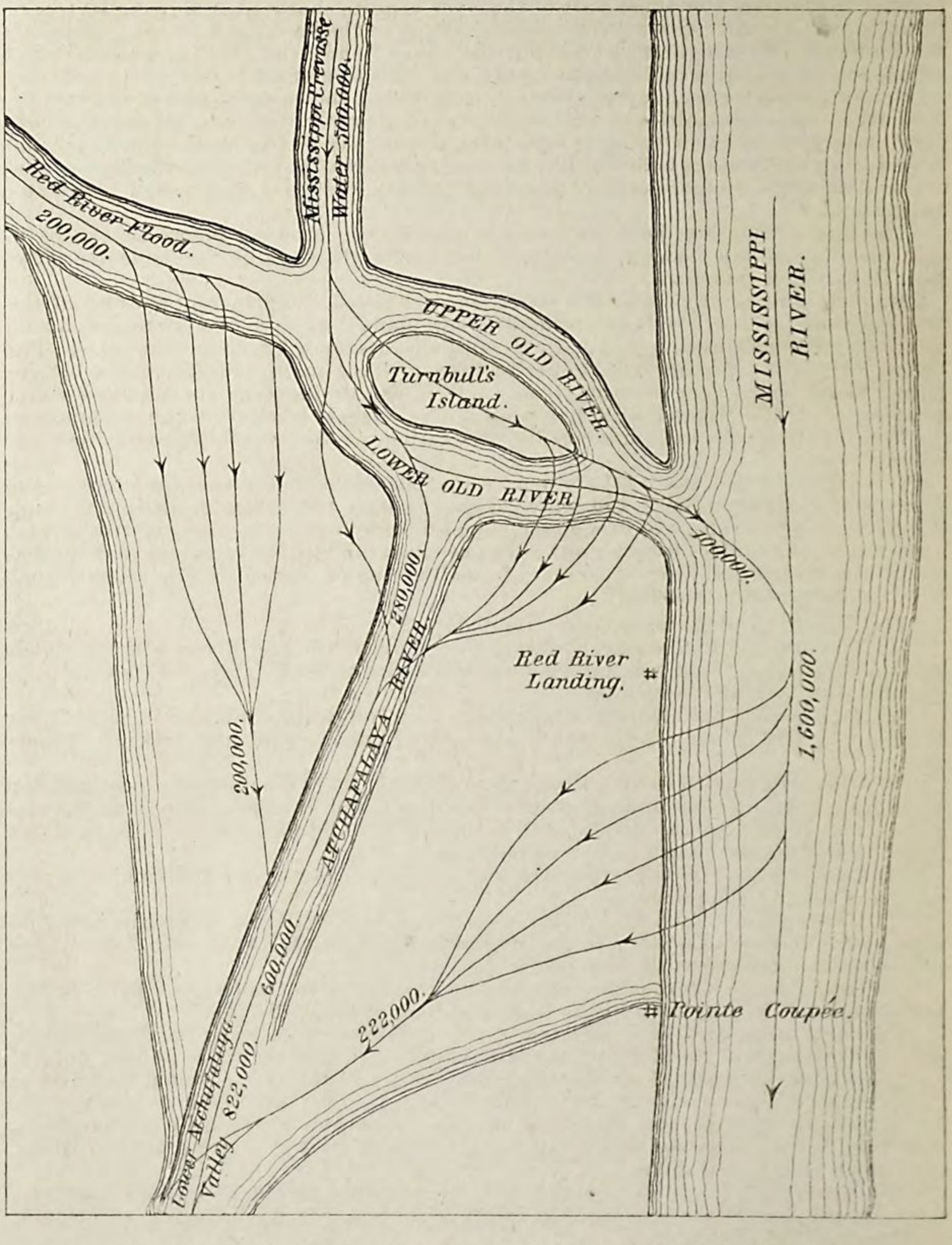


Diagram No. 1, *showing the inflow and outflow of the flood of* 1882.

correspond to the lowest water known in the Mississippi and the Red, and supposing them to be coincident, there would be but very few days, and only at intervals of years, when the depth would not be greater. The low-water surface at the head of Turnbull's Island to be 10 feet above the low-water surface of the Mississippi at the mouth. This would give a slope of 10 feet in 9 miles through upper Old River, in the extreme case of low water, and would give a velocity of 2,1874 feet per second, or 1.49 miles per hour; the low-water slope down the Atchafalaya to be 2 feet to the mile, and the bottom of the river to be brought parallel to this surface. This

would give a velocity of 2.54 feet per second or 1.73 miles per hour. I would propose to bring the bottom of the Atchafalaya up to this grade by the process of silting up, to be accomplished by the construction of submerged dams of brush and stone, which would be placed at intervals of about 1 mile, the silting between the dams to be assisted by double rows of submerged piles with foot-mats at intervals of, say, one-quarter of a mile. The sides of the low-water channel to be defined by longitudinal dikes of low mattress work where necessary. The channel down upper Old River to be likewise defined, with occasional brush sills across the bottom, to regulate the

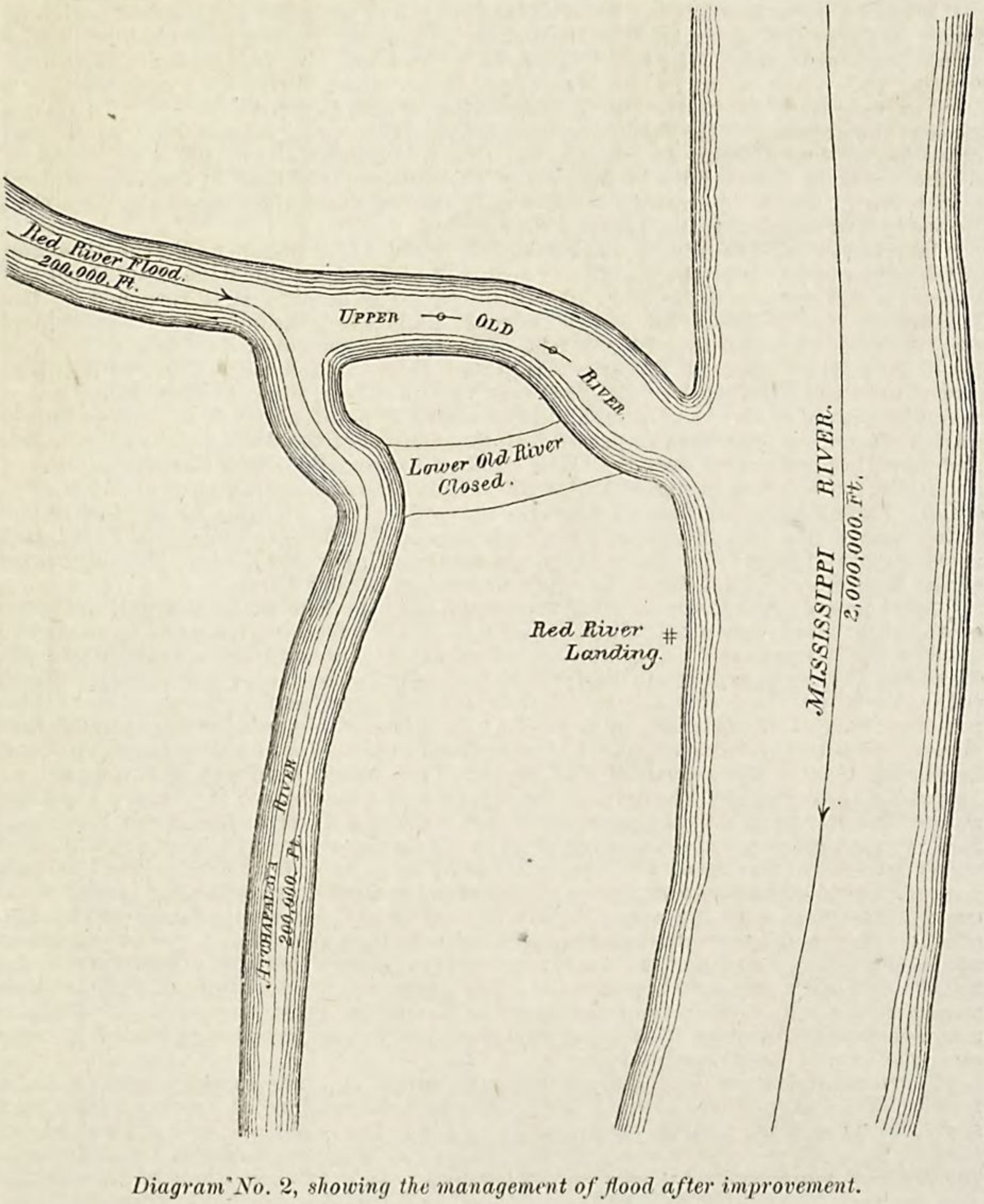


Diagram No. 2, showing the management of flood after improvement.

depth and cross-dikes of piles to confine the channel. Assuming that the water in the Atchafalaya might fall to 2.0 on Barbre's gauge, which is .8 foot lower than ever known and only 1.0 foot above Gulf level, the allowance being made to provide for the lesser flow into the Atchafalaya, the total low-water fall from the head of Turnbull Island to the lower end of the improved channel would be 12 feet, and would extend 6 miles from the head of the island to a point about 3 miles below Barbie's Landing, which would be about 1½ miles above the beginning of the levee on the right bank. Lower Old River I would close gradually, partly by permeable dikes to

cause deposit, the final closure to be by building a levee, if it should be found necessary.

"This plan is based upon the leveeing of the Tensas front, which now seems assured. Now, let us apply the various conditions of the present state of affairs to this plan to see how far it will meet the requirements of the case.

"With regard to the Mississippi River, none of its water would pass down to the Atchafalaya ordinarily, and at no time could it pass in very great quantity or for any extended period of time. As a consequence of this there would be no reason for the existence of the Angola Bar if the regular curvature of the bend of the river were compelled.

"With regard to Red River. The violent changes of its lower slope would be transferred to upper Old River, and be limited to a confined regularized channel which would maintain itself. The building of the levees along the Tensas front, thus preventing the escape of any of the Mississippi River water, fortunately simplifies, to a very great extent, the matter of the disposition of the Red River floods. To give a clear understanding of the flood condition of the rivers under discussion, I would call attention to the following two diagrams. No. 1 illustrates the overflow and outflow of the water in the vicinity of lower Red River during the flood of 1882, the highest ever known. No. 2 illustrates the same with the river improved upon the plan that I present and supposing the Tensas Front leveed:

"During the flood of 1882 it was estimated, upon surveys made under the direction of the Commission, that the maximum escape of water from the Mississippi River between the Arkansas and the Red, after deducting the amount that returned to the Mississippi, was 500,000 cubic feet per second; and calling the flood of the Red 200,000 feet, it would be noted that 700,000 feet of water per second crossed the latitude of lower Red River west of the Mississippi; of this amount more than 200,000 feet flowed over the right bank of the Red west of Old River, none of Red River water making its appearance in the Atchafalaya above a point about 3 or 4 miles below Barbre's Landing; 280,000 feet passed into the channel of the Atchafalaya at its head, and enough more passed over the right bank of Lower Old River to make a total of about 600,000 feet flowing past the latitude of Red River Landing west of the Mississippi. These figures are from Commission surveys. The remaining 100,000 feet of the inflow passed into the Mississippi through Lower Old River, Upper Old River, and across Turnbull Island and the country just north of Upper Old River. The discharge of the Mississippi at Red River Landing was about 1,600,000 feet.

"After passing Red River Landing the escape from the Mississippi through crevasses on the right bank down to Point Coupee was 222,000 feet, which went to swell the flood of the Atchafalaya Valley, making the total Atchafalaya discharge 822,000 feet. With the Tensas front leveed, the 500,000 feet of crevasse water would be confined to the Mississippi channel; there would then be but 200,000 feet for which outlet must be provided west of the Mississippi, supposing it inadmissible to discharge any of Red River flood into the Missiissippi. Let us suppose a Mississippi flood to reach the flood height of 1882 at the mouth of Old River. This would be about 48.5 referred to Barbre's Landing gauge, that gauge having its zero 3 feet above Red River Landing gauge, and the flood slope being about 3 feet from Old River to Red River Landing. Now, to prevent any water escaping from the Mississippi, or any passing into it, the water surface of the head of Turnbull Island must be 48.5 referred to the Barbre's gauge, and the channel down the new Atchafalaya must have sufficient capacity to carry 200,000 feet with the water surface at that height. A computation of the discharge through the new cross-section at what is known as section 4, near the head of the Atchafalaya, and about the narrowest section, shows that the discharge will be 200,000 feet with the water surface at that point at an elevation of 48.15, which would give a fall .35 foot from the head of Turnbull Island to section 4, which is ample slope for that part of the river as determined by computation at what is known as section 8, Old River (see map).

"In the computation for section 4, the assumption is made that the slope will be at least equal to the flood slope of 1882. Athough the surface at section 4 is to be 2 feet lower than 1882, I think there can be no doubt that the slope will at least equal that of 1882, when we consider that the lower Atchafalaya Valley is to carry only 200,000 feet, while in 1882 it carried 822,000 feet. As a further proof of this I will cite the fact that whilst the flood surface of 1874 was 3.5 feet lower than the flood surface of 1882 at Barbre's Landing, it was about 7 feet lower at the mouth of Bayou Courtableau, 50 miles distance, as established by one of my assistants. The following computations are made to exhibit the discharge capacity of the Atchafalaya River:

"Atchafalaya, section 4 (survey of 1881). Humphreys and Abbot's formula: Water elevation, top of flood, 49.9, Barbre's gauge: $A = 43,100$; $W = 1,038$; $P = 1,094$; $S = .00011364 = .6$ per mile; $V = 6.76$; $Q = 291,356$.

"Assistant Engineer Ewens' discharge measurements made at a point above section 4 (March 31, 1882): A = 38,500; W = 1,030; V = 7,288; Q = 280,613.

"Proposed Atchafalaya section 4, with submerged dam. Water elevation 48.15, Barbres gauge: A = 33,769; W = 1,070; P = 1,100; S = .00011364 = .6 per mile; V = 5.919; Q = 199,879.

"The computation of the discharge through section 4 (survey of 1881) is based on the actual flood slope of 1882, as established by levels of H. W. Reynolds, under the direction of the Commission. This computed discharge is 3.8 per cent. greater than the actual measured maximum discharge as determined by Assistant Engineer Ewens at a section a short distance above. An examination of Mr. Ewens' notes shows that this section on December 23, 1881, when the water was at the lowest stage at which a discharge was measured, was 3.5 per cent. greater than on March 31, 1882, the date of the maximum discharge.

"It is almost certain, then, that section 4, only a short distance below it, suffered a similar decrease of area. The above computed discharge of section 4, decreased by 3½ per cent. of 280,600, would give 281,535 cubic feet, showing that the computed discharge at section 4 agrees very closely with the measured discharge. This, then, allows us to make the necessary comparison of the discharge capacity of this section as it was in the flood of 1882, and as it would be with the proposed improvement. In the flood of 1882 it discharged 280,600 feet per second. With the proposed raising of the bottom and with water surface lowered nearly 2 feet, it would discharge 199,879 feet, that is, the entire Red River flood.

"As this section is shown in the table in Major Benyaurd's annual report for 1882 to have the smallest area of any of the sections in the first three miles of the Atchafalaya, any other section would have a greater capacity for discharge.

"The following is a computation of the slope at section 8, Lower Old River, requisite for a discharge of 200,000 feet, with bottom raised:

"Section 8, Lower Old River (survey of 1883): Assumed water surface, 48.5, Barbre's gauge, with submerged dam. Assumed Q = 200,000; A = 97,139; V = 20,589; W = 2,920; P = 2,935: Computed S = .000001596 = .0084 foot per mile.

"The above computed slope of about .01 foot to the mile would consume only .025 foot of the .35 foot between elevation 48.5 at head of Turnbull Island and 48.15 at section 4, leaving .325 foot slope for the half mile above section 4. As the average cross-section width in this half mile is about 1,300 feet, the greater part of this slope would be utilized in overcoming the bend resistance.

"It would then be seen that with a flood equal to that of 1882 the flood height at Barbres Landing would be reduced nearly 2 feet with the improved channel, and the flood height on the Lower Atchafalaya would probably be reduced to such an extent that only small levees would be required to prevent overflow.

"As the theory upon which the Commission is proceeding in building levees supposes a reduction of flood heights of the Mississippi, after the completion of the levees, the flood surface at the mouth of Old River would be lower than above given, if the theory is correct, in which case a part of the Red River flood would be discharged into the Mississippi, with a consequent lowering of the Atchafalaya surface.

"The same effect would be produced if the flood of the Mississippi and Red were not coincident.

"With regard to Old River: During the process of forming the new channels Lower Old River would necessarily be used. I would propose to keep it in navigable condition by a system of dikes, to direct and confine the low-water channel without causing too great a scour. The dikes from the foot of the island to the Mississippi might be a part of the permanent improvement, and the scour of the current passing either way through them would probably maintain a navigable channel through the bar at the mouth. I would remedy the sliding banks difficulty, partly by moving the channel farther away from the worst bank near Ash Cabin, and by making a sufficient number of drains to prevent water standing between the banks at a higher level than the river. When Upper Old River became the navigable channel, its confined limits, regular cross-section, and constant current would maintain it in good condition and sweep out its depth through the bar at the mouth. The sliding banks are not so troublesome as in Lower Old River, and the standing pools in the low middle ground would soon disappear by compelling the silting up of regular banks with slopes towards the river.

"With regard to the Atchafalaya, the fixing of a stable bottom and immovable thalweg would stop the immense and irregular caving of the banks in the improved channel; they would become more regular in outline by the wearing away of projections and silting up of cavities, and as a consequence the dangerous eddies and whirlpools would disappear or be greatly lessened. The natural channel below the improvement, having less water to carry, would not enlarge, and the banks would gradually become more regular, small levees would confine the floods, and the deserted plantations would again be cultivated.

"The project that I present thus appears to meet all of the conditions of the problem and overcome the difficulties of the present situation, giving a permanent and sufficient improvement of the navigation without disturbing the present routes of commerce, and making proper provisions for flood discharge. If any of the conditions to be met here escaped my observation, I have no doubt the Commission will discover them. In the prosecution of this plan, I would propose to commence the work at the lower end on the Atchafalaya, constructing the dams in the order of 1, 3, 5, 7, as it might be found that 2, 4, 6 would not be necessary, or their cost lessened by decrease of height from the silting up of the bottom. I would not at first build the dams to their ultimate height, so as to prevent any sudden and harmful increase of slope.

"According to the testimony of M. Jacquet, chief engineer of Ponts et Chaussées (see Colonel Merrill's translation on the Improvement of Non-Tidal Rivers, page 159), submerged dams may be brought to within 8 feet of low-water surface without causing the least injurious disturbance on the surface.

"The following is an approximate estimate of the cost of this work:

ATCHAFALAYA RIVER.

7 submerged dams of brush and stone, containing 7,365,719 cubic feet, at 4 cents	$294,630
8 miles = two-thirds of entire distance on both sides of channel from Turnbull's Island to lower end of improvement = 42,240 feet low longitudinal mattress dikes of brush and stone, 3,168,000 cubic feet, at 4 cents	126,720
Cross-lines of submerged piles, 13,600 linear feet, at $5	68,000
Excavation for channel, 868,000 yards, at 10 cents	86,000
	576,150

UPPER OLD RIVER.

12 miles = two-thirds of entire distance on both sides of channel from head of Turnbull's Island to the Mississippi = 63,360 feet low longitudinal mattress dikes of brush and stone = 4,752,000 cubic feet, at 4 cents	$190,080
36 brush and stone sills across channel, 1,080,000 cubic feet, at 4 cents	43,200
41,000 linear feet cross-dikes, at $4	164,000
Excavation for channel, 408,500 yards, at 10 cents	40,850
	438,130

CLOSING LOWER OLD RIVER.

4 dikes = 12,000 linear feet, at $4	$48,000
Atchafalaya River	576,150
Upper Old River	438,130
Lower Old River	48,000
Aggregate	1,062,280

"As Lower Old River will necessarily be used for communication with the Red and Atchafalaya (pending the completion of work under any plan that might be adopted), I recommend that the low-water channel be directed and defined by a system of dikes about as indicated on tracing-sheet 2, and that a Menge dredge should cut drains to the ponds in the low ground, and to assist in correcting the channel. The following is the estimate of the cost of this temporary work which would be utilized as a part of the permanent work if any project should meet the approval of the Commission.

ESTIMATE FOR TEMPORARY IMPROVEMENT AT LOWER OLD RIVER.

13,600 linear feet pile-dikes, at $3	$40,800
7,100 linear feet low mattress longitudinal dike, at $3	21,300
Menge dredge, with scows	10,000
One season's work with dredge	3,000
	75,100

"Of the work for the above outlay about one-half would be utilized in the plan for permanent improvement. The plant required for above work, in addition to the dredge, would be similar to that used in work on the Mississippi. Much to my disappointment, the surveys of the vicinity of mouth of Red River have not been completed, and I am obliged to present tracings from old maps, which, while not being correct in detail, are sufficiently so in general outline to give a fair understanding of the project presented.

"The exact location of dams or lines of channel is not attempted, and would require careful survey and study. Tracing-sheet No. 1 relates to the general plan; No. 2 to the temporary work in Lower Old River. The accompanying papers are two sheets (tracings showing channels) and seven sheets (cross sections), which are mailed in a separate package.

"Very respectfully, your obedient servant,

"AMOS STICKNEY,
"*Major of Engineers, U. S. A.*

"Lieut. Col. C. B. COMSTOCK,
"*Corps of Engineers, U. S. A.,*
"*President Mississippi River Commission.*"

In this project provision is made for keeping a navigable channel through Old River during the progress of the work. No definite action having been taken on this project, I was directed by the Commission to maintain the channel as heretofore by dredging. Having obtained the proper authority for the hire of a plant, two tugs and a stern-wheel steamboat started the work of scouring on August 8, 1884. At this time the depth of water was as follows:

On the bar at mouth of Old River, 13.5 feet. From mouth of Old River to the Atchafalaya the least depth was 13 feet on the crossing. On the bar at the head of the Atchafalaya River the least depth was 14 feet.

The tugs employed on the work were of sufficient draught and power to stir up the bottom long before the depth decreased to an extent to cause any interference to navigation. They worked until August 31, when the river had fallen to 9.4 feet at Red River Landing, and 6.8 feet at Barbre's Landing. It was then found that they could not cut away the bottom so as to maintain a channel deep enough for them to continue at work, and after some narrow escapes from capsizing, they were laid up at Barbre's Landing. A scraper was then made of anchors, and the lip of a dredge dipper fastened to a horizontal timber and hung over the bow of the stern-wheel steamer, which, backing down stream, dragged the scraper, and by this means gradually deepened the channel. But this was not sufficient to maintain a channel, as the material in suspension in the Mississippi River water was deposited in the comparatively broad channel between Chandler's and Barbre's. To confine the flow to a narrower channel, spurs were thrown out from the bar shore. They were constructed of willow brush, thrown between two rows of stakes, and weighted with sand-bags. Fifteen of these spurs, each about 60 feet long, were placed, and produced a good effect. Two of these willow structures were alse placed on the bar at the mouth of Old River to define and help deepen the channel. A Menge dredge was employed to work in connection with the other boats. It was to have been at Old River about August 7, but owing to a breakage of her machinery, she did not arrive till August 26. This delay, however, was of little consequence, as the channel had been maintained with plenty of depth. It commenced work September 1, in the bar at the mouth, but owing to inability to hold itself in the current, accomplished little good. It was then taken to the bar at the head of the Atchafalaya, which had increased in width and shoaled considerably.

After working a short time it was removed to await new lines and anchor. On September 15 it was again placed at work on the bar at the mouth, and has been doing better but not entirely satisfactory work.

On September 12, the scraper having deepened the channel over the Atchafalaya bar to admit the tugs, they were put to work, and have maintained at least 7 feet depth. At last reports the depths through Old River were as follows:

From mouth to the gut, least depth, 7 feet; in the gut, least depth, 5 feet; from the gut to Chandler's Landing, least depth, 6 feet; Chandler's to Barbre's, least depth, 4 feet; on Atchafalaya bar, 7 feet.

This method of keeping Old River navigable during low water cannot be relied on. We have had a hard fight to maintain the channel, and I would recommend that some structures be placed for contracting the low-water channel before another season.

Approximate estimate of the cost of the work for the rectification of the mouth of the Red and Atchafalaya rivers, according to my project of December 15, 1883, with 10 per cent. added for contingencies, is $1,072,902.80.

The following is the report of Mr. A. O. Wilson on the survey of the vicinity:

"SURVEY OF THE MOUTH OF RED RIVER AND VICINITY.

"UNITED STATES ENGINEER OFFICE,
"*New Orleans, La., April* 30, 1884.

"MAJOR: I have the honor to submit the following report, with the map, cross-section sheets, and tables of gauge readings and current observations, made from the survey of the mouth of Red River and vicinity.

"In accordance with your instructions to proceed to the mouth of Red River and make a thorough and accurate survey of the vicinity, relocating and repeating all the cross-sections as shown on the maps from the surveys of 1879, 1880, and 1881, I arrived at the Red River Landing June 10, 1883, my party of twelve being complete, with the steam-launch Maud Rand, on the 22d of June.

"EXTENT AND METHOD OF SURVEY.

"The survey extends on the Mississippi River from a point below the Red River Landing to a point 2 miles above the mouth of Old River, consisting of a carefully chained traverse line up the right bank, with accurately located triangulating stations half a mile apart, from which a series of angles were taken upon flag stations placed along the opposite bank at every point or change in the line of the bank, and upon all prominent buildings, Government lights, and four triangulating stations along the left bank.

"The distance between the first two triangulating stations on the right bank is 2,235.86 feet, carefully measured and checked with a steel tape measure, constituted the base line of the triangulations, whereby all the other chained distances between stations have been checked and proved correct.

"The line of the top of the bank was taken by measured offsets every 200 feet from the transverse line. Sixteen cross-sections were taken in the Mississippi from Carr's Point to the Red River Landing; the locations of the soundings were made by angles measured by two transits on the stations, chosen so as to give an intersection on the range of the cross-section, each section being sounded over twice, the cross-sections being carried on to the top of the bank and connected with the traverse line by levels.

"A chained line, run with a transit and checked by stadia measure, was run from the swamp below the Red River Landing along the top of the levee to a point 5 miles below Simmsport, on the Atchafalaya River, with the topography, locating all churches, schools, gins, houses, roads, and fences in the vicinity of the river, also all the Atchafalaya cross-sections.

"A traverse line was run along the right bank of Old River from the Mississippi to the foot of Turnbull's Island, locating the cross-sections U, D, V, and H, with offsets every 200 feet, to the top of the bank, and angles on flag stations on the opposite bank; thence along Turnbull's Island, relocating the cross-sections of 1880 and 1881 in the Lower Old River, lettered, respectively, T, S, R, P, N, M, L, and K, where it is connected from Ash Cabin by triangulation with the line on the top of the levee near Chandler's Landing; also with the chained transit line, checked by stadia measure, running completely around Turnbull's Island, which locates all levee work, roads, and buildings on the island; also the 11 cross-sections taken in the Upper Old River, the cross-sections in the Red River, taken for the low-water discharge, and the cross-sections in Old River between the mouth of Red River and the head of the Atchafalaya River, previously taken in 1879, 1880, and 1881. A chained transit line was run from the foot of Turnbull's Island connecting with the Mississippi traverse line at Carr's Point.

"A chained transit line was run from the Mississippi at Carr's Point, locating the high ground and levee work, to the Upper Old River, connecting with the traverse line on Turnbull's Island at Cross-section No. III.

"The transit lines were connected with all the known fixed points of previous surveys, and permanently referred to 6 stone monuments, placed in pairs, one pair located on the high ground back from the Mississippi at Carr's Point, 1,376.05 feet apart; the second pair near the head of Turnbull's Island, 1,722.9 feet apart; the third pair on the side of the road between Chandler's Landing and Barbre's Landing, 1,611.1 feet apart, with Mississippi River Commission iron bench-mark in the plantation of J. Tonas, and the stone monument bench-mark in the levee directly in front of the iron bench-mark, near the residence of J. Tonas; also with the Coast and Geodetic Survey stone monument half a mile above the mouth of Old River, on the right bank of the Mississippi River.

"LINES OF LEVELS.

"Two lines of levels were run from the Red River Landing to Barbre's Landing starting from a bench-mark established in 1880 by Mr. Rees; both lines agree with each other, and with the difference between the Red River Landing gauge and that at Barbre's Landing of 0.32, as established by Mr. Rees in 1880.

"A line of levels was carried down the Atchafalaya, checking with itself and with the bench-marks of Mr. Collins at Simmsport. A line of levels was carried from the mouth of Old River up the Lower Old River, and connecting with the line along the levee on every cross-section run from Turnbull's Island to the levee; another line ran completely a round Turnbull's Island, showing the height and every break in the

levee work on the island, connecting and checking with a line of levels run from Barbre's Landing gauge to the discharge sections in Red River near the head of Turnbull's Island.

"A line of levels was run up the right bank of the Mississippi to a point 2 miles above the mouth of Old River; another line was run from the high ground at Carr's Point, showing the height and breaks of the levee work between the Mississippi and the Upper Old River, connecting with the level line on the island. A line was also run from Carr's Point across the bottom of the old bed of the Mississippi to the foot of Turnbull's Island. Bench-marks were established about every half mile on these lines, from which all the cross-sections were taken and the surface of the water at the time of sounding.

"NUMBER AND LOCATION OF CROSS-SECTIONS.

"The sixteen cross-sections in the Mississippi number from 0, at Carr's Point, to 15, at the Red River Landing; the numbers from 1 to 7 are in identically the same locations as sections previously taken in 1880 and 1881.

"*Cross-sections in Red, Old, and Lower Old rivers.*—Number 1, with another section sounded 200 feet below it, at the mouth of Red River, were taken on the 16th of October for the low-water discharge of Red River, the gauge at Barbre's Landing reading at the time —0.3 foot. At this time both the Upper and the Lower Old rivers were dry, so that the low-water discharge of Red River of 1882, amounting to 6,951 cubic feet per second, is exactly the same as the discharge through the head of the Atchafalaya River. The observations for the discharge were taken on a perfectly calm day by a series of floats run with sinkers at mid depths on each subdivision, the river being divided into ten subdivisions, and the discharge for each being calculated separately.

"Cross-sections 5, 7, 8, A, B, and C, in Old River, between the mouth of Red and the head of the Atchafalaya, are located as nearly as possible over the same lines as those similarly designated in the previous surveys. In the Lower Old River the cross-sections are lettered and located as those of the two previous surveys, and are as follows, commencing at Barbre's Landing: E, F, G, I, Z, X, K, L, M, N, P, R, S, and T, at the foot of Turnbull's Island; in the mouth of the river, between Turnbull's Island and the Mississippi, Cross-sections D, V, and H, as located and sounded by Mr. John Ewens in 1882, and Section U of previous surveys.

"In the Atchafalaya the sections are distinguished by numbers. No. 2, at the head, down to No. 12, 2 miles above Simmsport, are over exactly the same line of section as those of Mr. Rees. Nos. 2, 4, 6, 8, 10, and 12 were taken; the others, Nos. 13, 14, 15, 16, and 17, though not exactly on the line, can be compared with sections previously taken close to them by Mr. H. C. Collins in 1880. The soundings for all the above-mentioned cross-sections we carefully located by angles measured with a transit, and calculated from a carefully measured base of not less than 500 feet, each section being sounded over three different times, each line being plotted and calculated separately from the others, so as to give a thorough check and detect any error.

"The cross-sections in the Upper Old River, with the exception of a part of two which were sounded as those in the Lower Old River, were taken by level and chain across the dry bed of the river; all cross-sections were connected with the traverse lines, both by transit and level. To facilitate any future comparison that may be required, the sections of the Upper Old River are numbered in Roman figures. No. VIII follows nearly the line of No. III of the survey of 1879; No. VII, that of No. V; No. VI, of Nos. VII. Nos. V′, V, IV′, IV, III, II, and I are new sections. The map will show clearly the location and extent of the cross-sections; also the soundings taken and located by the intersection angles of two transits in the mouth of Old River and the Mississippi adjacent.

"OBSERVATIONS OF THE DIRECTION AND VELOCITY OF THE CURRENT IN THE MOUTH OF OLD RIVER.

"According to your letter of instruction received July 18, 1883, notes were taken every day of the direction of the current, and the velocity was ascertained by the running of two floats with sinkers suspended at average mid-depth. The course of the floats was about 50 feet on either side of the line of the deepest water in the channel, and the time taken while passing a carefully measured base line. The results of these observations are shown in the table of comparative gauge-readings, direction and velocity of the currents in the mouth of Old River.,

"The actual readings of the Red River Landing gauge are reduced by 0.3 feet to the datum of the Barbre's Landing gauge, the zero of which is 0.3 feet above the zero of the Red River Landing gauge; and, by the following extract from Maj. W. H. H. Benyaurd's report to the Chief of Engineers, February 15, 1882, it is 3.06 feet above the level of Gulf extract.

"The lowest water ever known at that point occurred on September 18, at which time the water service had fallen at Barbre's 1.20 feet below the zero of that gauge. This zero is 0.3 of a foot above the zero of the gauge at Red River Landing, which corresponds to the low water of 1872.

"From the date of the highest water of the year 1883, which occurred April 9, the direction of the current in Old River was out towards the Mississippi until July 1, when it changed in towards the Atchafalaya; during this time the fall of the water was slow and only amounted to 6.8 feet. The water was over the banks of Old River below the foot of Turnbull's Island until the end of July; the same condition of the direction and course of the current, as Mr. Rees notes in his report on the Survey of 1880, occurred frequently, namely, that at times when the difference of the water level of the Mississippi and the Red River were very slight, the current came down the Upper Old River from Red River to the foot of Turnbull's Island; thence, by the Lower Old River, into the Atchafalaya River. The annexed table of comparative gauge readings and notes of the direction of the current and its velocity will show that during the fall of the water the direction changed visibly five times, and that it was often almost stationary. The fall of the water was gradual until September 1, when the stage of the river was 14.90 at both gauges, after which the fall was rapid. October the 15th both the Upper and Lower Old rivers were dry.

"October 18, the water in the Mississippi having risen to 5.9 feet on the Red River Landing gauge; the flow of water in the Lower Old River resumed the surface fall from the Mississippi to Barbre's Landing, being 5.8 feet, and increasing to 6.9 feet on the 23d and 24th of October, the current at this time in the narrow gut near Ash Cabin being terrific. Both rivers steadily rose until December the 14th, the current, owing to the head of water more than to the surface fall, being very strong. The water fell on the Barbre's Landing gauge 9.4 feet from December 14 to December 30, the velocity of the current steadily decreasing, after which it suddenly increased in velocity and rose rapidly until the 15th of January, 1884, the strongest current being on the 9th and 10th of January, at the rate of 7.04 feet per second, or very nearly 5 miles per hour. January 23 the current was again almost imperceptible. At this date the current observations ceased, the survey being completed.

"OBSERVATIONS ON THE ATCHAFALAYA.

"The bottom and both banks of the Atchafalaya River are very ragged and irregular in their formation, caving and washing out in small, deep bays, the mouths of which are afterwards blocked up with sand-bars; large masses of earth frequently sliding into the bottom and standing up in sharp ridges or in rough pyramids, changing greatly the shape of a cross-section, and causing the current at high water to be very turbulent, full of whirlpools and vertical eddies.

"The table No. 2, showing the change in the areas above and below the datum line of the zero of Barbre's Landing gauge, with the amount of their scour or fill from 1880 to 1881, and 1881 to 1883, gives the information that the Atchafalaya continues to enlarge on every cross-section with two exceptions only, and those between the years of 1880 and 1881, the first on Cross-Section No. 2 near the head, amounting to 1,550 square feet below the zero line, the other was on Cross-Section No. 6 and only amounted to 300 square feet. By examining the comparative cross-sections of that year in the Lower Old River this shoaling of the head of the Atchafalaya will be accounted for by the enormous scour shown on almost every cross-section, and the fact that there was a steady and strong current from the Mississippi towards the Atchafalaya during the fall from high to low water of 1881.

"The nature of the soil of which the bottom and banks is composed is of a very variable character, and in no portion within the limit of the survey can a cross-section be obtained that will show the same character of soil from bank to bank. A notable subsidence is shown on the comparative Cross-Section No. 6, where a very large mass of bank, apparently of a stable character, settled vertically, leaving a perpendicular break in the bank of 13 feet in height. This took place between the months of June and November, 1883.

"The flood surface slope at the highest stage of the Atchafalaya ever known on the first 32 miles from the head had an average slope of 6½ inches to the mile, taken from the high-water mark at Barbre's Landing of the year 1882, which was found by Mr. H. W. W. Reynolds to be 50.21 feet above the zero of the gauge, and the high-water mark at West Melville, the point 32 miles from the head, where the New Orleans Pacific Railroad crosses, the elevation of which, referring to the same datum, is 34 feet, and would read 37 feet on the West Melville gauge as it now stands.

"I will here add the flood notes of 1884, as they may be of interest.

"By the different gauge readings the highest water at the Red River Landing, Barbre's Landing, and Simmsport (5 miles from the head of the Atchafalaya) gauges, was recorded March 30 and 31, 1884, and was as follows, respectively, referring to the datum of the zero of Barbre's gauge, 47, 48.60, and 46.55 feet, and the West Melville

gauge reading the same date March 31, 30.45 feet, and arriving at the highest point April 5, 30.8 feet. From the above data we find the flood surface fall to be on March 31, 1884, on the first 32 miles to be at the average rate of 6¾ inches to the mile, and on the first 5 miles 5 inches to the mile.

"The low-water surface slope of the Atchafalaya on the first 32 miles from the head, from the gauge readings October 16, 1883, was found to be five-eighths of an inch to the mile, and the discharge through the head 6,951 cubic feet per second, Barbre's gauge reading 0.3 below zero, and the West Melville, referring to the same 2.1 feet below, which was the lowest of the year, and Barbre's the next day, October 17, 1883, 0.4 foot below, at which time there was not the slightest discharge either from the Upper or Lower Old rivers, and the water very clear and free from sediment.

"OBSERVATIONS IN THE LOWER OLD RIVER.

"It is well known that what is now called Old River once formed the bed of the Mississippi River, now very much filled up by river deposit of a mixed and very unstable class of soil. In the Lower Old River, when the current is out towards the Mississippi, the bar on the north side builds rapidly. The growth of young willows opposite Barbre's Landing forms a natural screen through which the current runs, causing it to deposit its sediment along the bar which extends to the crossing near Cross-Section X, where it joins or overlaps the bar formed in a like manner along the south side of this part of the river by the current when it is 'in' from the Mississippi River.

"It is plain to the observer, and proved by a series of surveys, that as the direction of the current is subjected to change, either 'in' or 'out,' with a large natural screen to check the velocity and thereby precipitate the sediment carried by the flood waters, the condition of the low-water channel must continue to get worse. It is true that some years the low-water channel may improve temporarily. This is brought about, as in the year 1881, by the current continuing in one direction for an unusual length of time, and as this is more liable to be 'in' from the Mississippi owing to the closure of the Tensas by levees so that there is a possibility of the channel from the Mississippi through the Lower Old River being improved, but not without also increasing the enlargement of the Atchafalaya. The table showing the comparative scours and fills, and the cross-sections will show the enormous scour that took place during the year 1881, and the table of gauge readings with the direction and velocity of the current through the mouth of Old River account for it; the same tables also show and account for the very large amount of deposit shown from the year 1881 to 1883, and proves the eccentricity that the locality is liable to. The report of Major Benyaurd to the Chief of Engineers of 1882 mentions the possibility of a condition of the low-water channel as actually occurred this season of 1883. The very sluggish currents with the constant changes of direction show as in the year 1880, which, together with the rapid fall of both rivers after September 1, and the low stage that the water fell to on the Red River Landing and Barbre's Landing gauges, made it impossible to keep navigation open by the method of previous years; namely, the dredge at the mouth of Old River, and two propeller tugs with a stern-wheel steamer.

"All navigation through the Old River was stopped from September 27 to October 18. The sloughing and sliding in of the banks, remarked in previous low-water seasons, took place, to a very large extent, along both banks of the low-water channel of the Lower Old River, from the Crossing to the Mississippi. This is caused by the sustaining pressure of the water being removed, the suction power of the water oozing out through the sandy strata in the deposited soil with which the banks are formed. Where the sloughing of the bank is only slight, the water with which the banks are saturated has been enough to effect it; but, in every case where the sloughing has been extensive, land-locked water has been found in ponds or sloughs at some little distance behind the slides. The sliding in of both banks in what is called the Gut, near Ash Cabin, pushed the soft mud of the bottom up into two mud walls, with a channel only 22 feet wide between them. These walls being exposed to the air soon became hard enough to walk upon; in the portion of the Channel from Ash Cabin to the crossing flat-topped circular, mud lumps were forced up by water and gas jets, leaving them in the shape of an inverted soup plate, with a small, deep, round hole in the center. A very large subsidence on the right bank in the mouth of Old River took place August 28, 1883; it extended fully 2,000 feet along the bank, and its cross-section area is shown on Cross-Section V; in this locality the deposit on the top of the bank by levels taken February, 1883, and August 26 of the same year, amounted to 2 feet, divided into two distinct classes, the lower half being of pure sand and the upper of a soft, brown clay substance. The mud bars, or low-water banks, show by the cross-sections a large deposit all through the Lower Old River since 1881. The bar from Barbre's Landing to the crossing is formed chiefly of red sand similar to the banks of Red River; very little of this is seen in the bars between the crossing and the Mississippi River.

"OBSERVATIONS IN THE MISSISSIPPI RIVER IN THE VICINITY OF THE MOUTH OF OLD RIVER.

"The accompanying map of the Mississippi River from Carr's Point to the Red River Landing shows the location of the cross-sections, the contour lines of 1884, and the change in the line of the right bank above the mouth of Old River.

"In this portion of the river the comparative cross-sections show that the channel near the right bank is deepening greatly and the bank is steadily washing. In many places it is now almost perpendicular, though only one cave of any extent is noticeable below Carr's Point; the channel on the opposite side is shoaling up and the bank is making on the low-water portion.

"The cross-sections Nos. 1 to 7, inclusive, are a repetition of those of 1880 and 1881; Nos. 8, 9, 10, 11, 12, 13, 14, and 15 are new lines, but comparative cross-sections have been made from the soundings, on the lines of the three cross-sections taken below the mouth of Old River in 1881, No. 1 of which shows the right bank to be extending out; but with this exception and the shoaling of the deep channel near the left bank the cross-sections show considerable enlargement and a large scour on the Angola Bar. The comparisons may be affected by the different stages of the river at the time the soundings were taken, those of 1880 and 1881 being taken at less than 9 feet on the gauge, and those of this survey in January, 1884, with over 32 feet on the gauge and a strong current running. The contour lines show that a good, navigable channel of 20 feet below extreme low water exists both above and below the mouth of Old River as the survey extends either way.

"The location of the three cross-sections of 1881 below the mouth of Old River are shown by dotted lines on the map of the Mississippi, plotted on the scale of 200 feet to 1 inch.

"OBSERVATIONS IN THE UPPER OLD RIVER.

"The cross-sections in the Upper Old River show the bottom of the river in the channel to be 7.5 feet above zero on cross-section No. 11, and on the other sections from 4 to 6 feet above; the character of the bottom being soft mud, the banks as compared with the Lower Old River are much more stable and free from sloughing, and, with the exception of the entrance through the Sugar-House Chute, the river presents a much more navigable appearance and is favored by steamboatmen whenever there is water enough to go through it.

"The Upper Old River for its entire length may be said to have one old and reliable bank free from sloughing, though it is not always on the same side, and the opposite bank is more systematically contracted by the natural-growth willows than the Lower Old River; a very slight amount of work would concentrate and confine the low-water channel, and if by any means the current was so controlled, so as to cause it always to flow in one direction, the channel would quickly scour out and maintain itself.

"The survey was prosecuted under very great difficulties, the character of the malarial fevers peculiar to the locality being more virulent than the residents have known for years; of the party that I commenced with not one was able to remain through the survey with me; during the survey I had four different levelers, eight different rodmen, six cooks, and the changes among the boat and axmen were incessant; two of my party died soon after leaving the work, and several were ill for months afterwards, the amount of time lost by sickness being nearly equal to the actual time consumed while at work on the survey; this will account for the somewhat slow progress made on a at any time very tedious survey to make, on account of the difficulty in finding the exact location of the cross-sections previously taken so as to insure a fair comparison.

"Accompanying this report are:

"Table No. 1. Showing the gauge-readings from the date of the highest water of 1883 to the end of January, 1884, with the direction and velocity of the current through Old River during the time of the survey.

"Table No. 2. Showing the changes in the areas of the Atchafalaya cross-sections above and below the zero line of Barbres Landing gauge, which is approximately low water.

"Table No. 3. Showing the changes in the depths on the line of deep water in the low-water channel through Old and Lower Old River to the Mississippi River. A large map of the whole survey plotted on a scale of 800 feet to 1 inch.

"A map of the Mississippi River in the vicinity of the mouth of Old River, plotted on a scale of 200 feet to 1 inch.

"No. 1. Roll of cross-sections in the Atchafalaya River.

"No. 2. Roll of cross-sections in the Upper Old River.

"No. 3. Roll of cross-sections in the Old and Lower Old River.

"No. 4. Roll of cross-sections in the Mississippi River, 1884.

"No. 5. Cross-sections in the Mississippi below the mouth of Old River, 1881, compared with soundings of 1884.

"I have endeavored to divide up and arrange this report under different headings in order to facilitate comparison with the previous surveys and reports, and to save time in referring to different parts."

TABLE No. 1.—*Gauge-readings at Red River Landing, Barbre's Landing, and mouth of Old River, Louisiana, with directions and velocity of current through Old River, and rise and fall between Red River Landing and Barbre's Landing, referring to the zero of Barbre's Landing.*

Date.	Red River Landing.	Barbre's Landing.	Difference.	Old River, near the mouth.			Remarks.
				Direction of current.	Velocity of current per second.	Gauge.	
1883.					*Feet.*		
Apr. 9	44.90	46.30	1.40	Out *			High water of 1883.
10	44.85	46 30	1.45	Out			
11	44.75	46.20	1.45	Out			
12	44.65	46.10	1.45	Out			
13	44.53	46.00	1.47	Out			
14	44.42	45.80	1.38	Out			
15	44.30	45.60	1.30	Out			
16	44.15	45.50	1.35	Out			
17	44.00	45.30	1.30	Out			
18	43.85	45.10	1.25	Out			
19	43.70	44.90	1.20	Out			
20	43.57	44.80	1.23	Out			
21	43.45	44.60	1.15	Out			
22	43.33	44.40	1.07	Out			
23	43.33	44.40	1.07	Out			
24	43.21	44.20	0.99	Out			
25	43.11	44.10	0.99	Out			
26	42.95	43.90	0.95	Out			
27	42.80	43.80	1.00	Out			
28	42.73	43.90	1.17	Out			
29	42.73	43.90	1.17	Out			
30	42.64	43.60	0.96	Out			
May 1	42.58	43.50	0.92	Out			
2	42.48	43.40	0.92	Out			
3	42.40	43.30	0.90	Out			
4	42.35	43.20	0.85	Out			
5	42.37	43.30	0.93	Out			
6	42.37	43.30	0.98	Out			
7	42.20	43.10	0.90	Out			
8	42.15	43.00	0.85	Out			
9	42.20	43.00	0.80	Out			
10	42.20	43.10	0.90	Out			
11	42.20	43.10	0.90	Out			
12	42.17	43.10	0.93	Out			
13	42.14	43.10	0.96	Out			
14	42.10	43.10	1.00	Out			
15	42.10	43.10	1.00	Out			
16	42.10	43.00	0.90	Out			
17	42.08	43 00	0.92	Out			
18	42.05	43.00	0.95	Out			
19	42.00	42.90	0.90	Out			
20	41.95	42.80	0.95	Out			
21	41.90	42.80	0.90	Out			
22	41.80	42.60	0.80	Out			
23	41.60	42.40	0.80	Out			
24	41.40	42.20	0.80	Out			
25	41.15	42.20	1 05	Out			
26	41.10	42.10	1.00	Out			
27	40.80	42.00	1.20	Out			
28	40.60	41.80	1.20	Out			
29	40.45	41.50	1.05	Out			
30	40.37	41.40	1.03	Out			
31	40.50	41.40	0.90	Out			
June 1	40.30	41.20	0.90	Out			
2	40.20	41.00	0.80	Out			
3	40.20	41.00	0.80	Out			
4	40.15	40.90	0.75	Out			
5	40.00	40.70	0.70	Out			
6	39.90	40.60	0 70	Out			

* "Out" means towards the Mississippi River.

TABLE No. 1.—*Gauge-readings at Red River Landing, &c.*—Continued.

Date.	Red River Landing.	Barbre's Landing.	Difference.	Old River, near the mouth.			Remarks.
				Direction of current.	Velocity of current per second.	Gauge.	
1883.					*Feet.*		
June 7	39.80	40.40	0.60	Out			
8	39.70	40.30	0.60	Out			
9	39.55	40.10	0.55	Out			
10	39.45	40.00	0.55	Out			Current three miles per hour.
11	39.35	39.80	0.45	Out			
12	39.25	39.80	0.55	Out			
13	39.20	39.70	0.50	Out			
14	39.20	49.70	0.50	Out			
15	39.05	39.60	0.55	Out			
16	38.90	39.50	0.60	Out			
17	38.80	39.30	0.50	Out			
18	38.70	39.20	0.50	Out			
19	38.60	39.10	0.50	Out			
20	38.50	39.00	0.50	Out			Three miles per hour.
21	38.40	39.00	0.60	Out			
22	38.30	39.00	0.70	Out			
23	38.30	38.90	0.60	Out			
24	38.25	38.90	0.65	Out			
25	38.20	38.80	0.60	Out			
26	38.20	38.80	0.60	Out			
27	38.15	38.70	0.55	Out			
28	38.15	38.70	0.55	Out			
29	38.15	38.70	0.55	Out			
30	38.15	38.70	0.55	Out			
July 1	38.10	38.00	0.10	In*			Changes towards the Atchafalaya River.
2	38.05	38.00	0.05	In			
3	38.03	38.00	0.03	In			
4	38.01	37.90	0.11	In			Current very slight.
5	38.00	37.90	0.10	In			Do.
6	38.05	38.00	0.05	In			Do.
7	38.05	38.00	0.05	In			Do.
8	38.10	38.00	0.10	In			Do.
9	38.10	38.00	0.10	In			Do.
10	38.15	38.00	0.15	In			
11	38.25	38.10	0.15	In			
12	38.25	38.10	0.15	In			
13	38.25	38.00	0.25	In			
14	38.20	38.00	0.20	In			
15	38.15	38.00	0.15	In			
16	38.10	38.00	0.10	In			
17	38.00	38.00	0.00	In			Current changing.
18	37.90	37.90	0.00	In			Current imperceptible.
July 19	37.70	37.50	0.20	In			Current imperceptible.
20	37.45	37.20	0.25	In			Current very slight,
21	37.20	37.00	0.20	In			Do.
22	36.80	36.70	0.10	In			
23	36.40	36.50	0.10	Out	1.307	36.50	Changes.
24	36.00	36.10	0.10	Out		36.00	Strong wind; current very slight.
25	35.70	36.10	0.40	Out	1.294	35.77	
26	35.45	35.60	0.15	Out	1.358	35.55	
27	35.25	35.40	0.15	Out	1.232	35.30	
28		35.10					
29	34.80	34.90	0.10	Out	1.272	34.80	
30	34.50	34.50	0.00	Out	0.987	34.50	Very slow.
31	34.10	34.20	0.10	Out	1.149	34.10	Do.
Aug. 1	33.70	34.30	0.60	Out	1.713	33.70	
2	33.40	33.70	0.30	Out	1.862		
3	33.10	33.00	0.10	Out	1.917	33.30	
4	31.90	32.10	0.20	Out	2.342		
5		31.10					
6	29.50	30.60	1.10	Out	2.500		
7	28.40	29.90	1.50	Out	2.863		
8	27.30	28.50	1.20	Out	2.708		
9	26.30	27.90	1.60	Out	2.342	36.50	
10	25.40	26.90	1.50	Out	2.043	25.65	
11	24.70	25.10	0.40	Out	1.413	25.00	
12		24.50					
13	23.75	24.00	0.35			24.10	Almost imperceptible.
14	23.45	23.60	0.15	Out		23.75	Almost imperceptible.
15	23.15	23.30	0.15	In		23.40	Do.

*"In" means towards the Atchafalaya River.

TABLE No. 1.—*Gauge-readings at Red River Landing, &c.*—Continued.

Date.	Red River Landing.	Barbre's Landing.	Difference.	Old River, near the mouth.			Remarks.
				Direction of current.	Velocity of current per second.	Gauge.	
1883.					*Feet.*		
Aug. 16	22.80	23.00	0.20	.....	.....	23.10	Current imperceptible.
17	22.50	22.80	0.30	.....	0.197	22.80	Do.
18	22.20	22.50	0.30	.....	.....	22.40	Strong wind.
19	.....	22.10	.....	.....	.....		
20	21.30	21.80	0.50	.....	.....	21.50	Gale SW.
21	20.75	20.50	0.25	In.....	1.216	21.10	Current changes.
22	20.20	19.30	0.90	In.....	1.281	20.40	
23	19.50	19.90	0.40	Out	1.300	19.70	Do.
24	18.80	19.40	0.60	Out	1.055	19.05	
25	18.20	18.40	0.20	Imperceptible.	.....	18.35	Wind high; north.
26	.....	17.40	.....	.....	.....	.....	Sunday.
27	16.90	16.40	0.50	In.....	0.967	17.05	
28	16.30	16.10	0.20	In.....	1.042	16.45	
29	15.60	15.20	0.40	In.....	1.200	15.85	
30	14.95	14.50	0.45	In.....	1.126	16.15	
31	14.35	14.00	0 35	In.....	1.227	14.50	
Sept. 1	13.90	13.90	0.00	In.....	1.312	13.90	
2	.....	13.20	.....	.....	.....	.....	
3	12.95	1 .60	0.35	In.....	1.255	12.85	
4	12.45	12.10	0.35	In	1.257	12.40	
5	12.00	11.40	0.60	In.....	1.320	12.00	
6	12.50	11.20	0.30	In.....	1.100	11.50	
7	11.00	10.50	0.50	In.....	1.186	11.00	
8	10.50	10.10	0.40	In	1.236	10.55	
9	.....	9.30	.....	.....	.....	.....	
10	9.45	8.60	0.75	In.....	1.031	9.45	
11	8.95	8.00	0.95	In.....	0.987	9.00	
12	8.55	7.50	1.05	In.....	1.000	8.55	
13	8.10	7.00	1.10	In.....	1.060	8.15	
14	7.85	6.50	1.35	In	1.135	7.80	
15	7 60	6.00	1.60	In.....	1.084	7 60	
16	7.50	5.30	2.20	In.....	.....	7.60	
17	7.70	5.30	2.40	In.....	1.213	7.65	
18	7.20	5.00	2.20	In	0.933	7.10	
19	6.70	4.50	2.20	In	1.167	6.55	
20	6.25	4.00	2.25	In	1.086	6.17	
21	6.05	3.80	2.25	In	0.890	5.86	
22	5.80	3.30	2.50	In.....	0.644	5.70	
23	5.55	2.80	2.70	In.....	.....	.....	
24	5.40	2.50	2.90	In.....	0.326	5.26	
25	5 20	2.30	2.90	In.....	0 391	5.15	
26	4.90	2.10	2.80	In.....	0.256	4.86	
27	4.65	1.90	2.75	In	0.310	4.54	
28	4.50	1.50	3.00	In	0 325	4.40	
29	4.40	1.30	3.10	In	0.406	4.30	
30	4.30	1.20	3.10	In.....	.....	.....	
Oct. 1	4.20	1.10	3.10	In	0.391	4.20	
2	4.15	1.10	3.05	In.....	0.281	4.15	
3	4.10	1.00	3.10	In	0.301	4.10	
4	3.95	0.90	3.05	In	0.245	3.95	
5	3.80	0.80	3.00	No flow...	0.000	3.90	Old River is dry.
6	3.70	0.70	3.00	No flow...	0.000	3.80	Do.
7	3.65	0.40	3 25	No flow...	.....	.....	
8	3.65	0.20	3.45	No flow...	0.000	3.70	Lowest reading of Red River Landing gauge 1883.
9	3.80	0.00	3.80	No flow...	0.000	3.85	Zero, Barbre's gauge.
10	4.00	0.20	4.20	No flow...	0.000	4.08	No flow in Old River.
11	4.10	0.10	4.20	No flow...	0.000	4.14	Do.
12	4.20	0.00	4.20	No flow...	0.000	4.25	Do.
13	4.30	0.00	4.30	No flow...	0.000	4.35	Do.
14		0.00		No flow...	.....	.....	Do.
15	4.55	0.20	4.70	No flow...	0.000	4.60	Do.
16	4.80	0.30	5.10	No flow...	0.000	4.75	Do.
17	5 05	0.40	5.45	No flow...	0 000	5.20	Lowest water of 1883 on Barbre's gauge.
18	5.60	0 20	5.80	No flow...	0.000	5.75	Commencement of flow in Lower Old River.
19	5.90	0.10	5.80	In.....	0.574	6.10	
20	6.30	0.40	5.90	In.....	.....	6.50	Stormy.
21	6.80	0.70	6.10	In.....	.....	6.80	Do.

TABLE No. 1.—*Gauge-readings at Red River Landing, &c.*—Continued.

Date.	Red River Landing.	Barbre's Landing.	Difference.	Old River, near the mouth.			Remarks.
				Direction of current.	Velocity of current per second.	Gauge.	
					Feet.		
1883.							
Oct. 22	7.70	1.00	6.70	In.....	.....	7.70	
23	8.10	1.20	6.90	In.....	....	8.10	Stormy.
24	8.45	1.50	6.90	In	1.213	8.50	
25	8.75	2.00	6.75	In.....	1.320	8.75	Strong north wind.
29	9.05	2.50	6.55	In.....	1.173	9.05	
27	9.50	3.70	5.80	In.....	0.996	9.50	
28	.....	5.00	.....	In.....	.....	.....	
29	10.35	6.50	3.85	In.....	.....	10.40	Stormy.
30	10.65	7 10	3.55	In.....	1.760	10.75	
31	10.95	8.10	2 85	In.....	1.821	11.00	
Nov. 1	.....	8.80	.....	.....	....	.....	Dense fog.
2	11.05	9.20	1.85	In.....	1.885	11.10	
3	10.90	9.20	1.80	In.....	1.760	10.90	
4	.....	9.20	.....	In.....	.....	.....	
5	10.60	9.20	1.40	In.....	1.731	10.65	
6	10.65	9.30	1.35	In.....	.....	10.70	North wind.
7	10.90	9.40	1.50	In.....	1.676	10.95	
8	11.45	9.70	1.75	In.....	2.247	11.70	
9	12.35	10.30	2.05	In.....	2.640	12.45	Rapid rise.
10	13.60	11.00	2.60	In.....	.....	13.90	Stormy weather.
11	15.60	13.10	2.50	In.....	.....	.....	
12	17.35	15.40	1.95	In.....	3.249	17.50	
13	17.80	17.00	0.45	In.....	3.060	17.80	
14	18.20	17.80	0.40	In.....	2.400	18.15	
15	18.40	18.10	0.30	In.....	2.011	18 80	
16	18.55	18.30	0.25	In.....	2.030	19.55	
17	18.70	18.50	0.20	In.....	1.650	18.70	
18	19.00	18.70	0.30	In.....	.....	19.15	
19	19.30	18.90	0.40	In.....	1.760	19.30	
20	19.70	19.50	0.20	In.....	2.112	19.70	
21	29.05	20.60	0.55	Out	2.640	20.05	Current changes.
22	20.45	21.40	0.95	Out	.....	.....	Stormy weather.
23	22.00	22.30	0.30	Out	0.880	22.10	
24	22.40	22.60	0.20	Out	0.335	22.57	
25	22.50	22.70	0.20	Out	.....	.....	
26	22.55	22.80	0.25	Out	.....	22.70	
27	22.45	22.70	0.25	Out	.....	22.50	Almost imperceptible.
28	22.05	22.30	0.25	.....	.....	22.10	Point of observation changes to near Barbre's Landing.
29	21.80	22.10	0.30	Out	0.498	.....	
30	21.80	22.00	0.20	Out	0.586	22.00	
Dec. 1	22.05	22.20	0.15	In.....	1.056	.....	Current changes.
2	22.60	22.70	0.10	In.....	1.354	....	
3	23.45	23.30	0.15	In.....	1.959	.....	
4	24.25	24.00	0.25	In.....	2.446	.....	Current very strong at mouth of Old River.
5	25.15	24.80	0.35	In.....	3.106	.....	
6	25.80	25.30	0.50	In.....	3.520	.....	
7	26.30	25.70	0.50	In.....	3.300	26.48	
8	26.85	26.30	0.50	In.....	2.640	.....	
9	27.20	26.70	0.50	In.....	2.708	.....	
10	27.40	26.90	0.50	In.....	2.779	.....	
11	27.25	27.00	0.25	In.....	2.933	.....	
12	27.30	27.00	0.30	In.....	2.933	.....	
13	27.30	27.00	0.30	In.....	2.351	27.45	
14	27.40	27.10	0.30	In.....	2.843	.....	
15	27.30	27.10	0.20	In.....	2.640	.....	
16	27.10	26.90	0.20	In.....	1.992	.....	
17	26.70	26.60	0.10	In.....	2.400	.....	
18	26.25	26.20	0.05	In	1.885	.....	
19	25.50	25.60	0.10	Out	1.703	.....	Current changes.
20	24.60	24.90	0.30	Out	1.576	.....	
21	23.90	24.20	0.35	.....	1.371	24.12	
22	23.00	22.90	0.10	In.....	1.242	....	
23	22.25	22.70	0.45	.....	.....	.....	Sunday. Point of observation changed back to mouth of Old River.
24	(*)	21.90	.....	In.....	1.193	21.97	
25	(*)	21.20	.....	.....	....	.....	
26	(*)	19.60	.....	In.....	0.165	20.90	

* No gauge.

TABLE No. 1.—*Gauge-readings at Red River Landing, &c.*—Continued.

Date.	Red River Landing.	Barbre's Landing.	Difference.	Old River, near Barbre's Landing.			Remarks.
				Direction of current.	Velocity of current per second.	Gauge.	
1883.					*Feet.*		
Dec. 27	(*)	19.00	.....	In.....	0.165	20.29	
28	(*)	18.60	.....	In.....	0.165	19.90	
29	(*)	18.30	.....	In.....	0.165	19.55	
30	(*)	18.70	.....	.....	.....	.....	
31	21.85	22.20	0.35	Out	1.852	22.19	Stormy.
1884.							
Jan. 1	23.10	23.50	0.40	Out	3.017	23.18	
2	24.25	24.50	0.25	Out	1.553	24.30	
3	25.75	25.90	0.15	Out	0.000	25.85	Current changing.
4	27.30	27.30	0.00	In	2.355	27.35	Strong current.
5	29.05	28.70	0.35	In	2.355	29.20	Do.
6	30.10	29.80	0.30	In	.....	.....	Strong current, stormy.
7	31.05	30.70	0.35	In	.....	.....	Strong current.
8	31.90	31.60	0.30	In.....	4.224	32.00	Very strong current.
9	32.55	32.30	0.25	In	7.040	32.40	Do.
10	33.10	32.80	0.30	In	7.040	33.30	Do.
11	33.55	33.20	0.35	In.....	5.867	33.85	Do.
12	33.75	33.40	0.35	In	5.280	33.78	
13	33.90	33.60	0.30	In	.....	.....	
14	33.95	33.70	0.35	In.....	4.600	33.88	
15	34.00	33.80	0.20	In	4.224	34.03	
16	33.85	33.80	0.25	In.....	3.911	33 99	
17	33.70	33.80	0.10	In.....	3.520	33.89	
18	33.75	33.80	0.05	In	3.200	33.99	
19	33.75	33.90	0.15	In	3.017	34, 00	
20	33.45	33.60	0.15	In.....	.....	.....	
21	33.00	33.30	0.30	In.....	1.624	33.39	
22	32.55	32.90	0.35	In.....	1.056	32.99	
23	32.10	32.50	0.40	In.....	.....	32.40	Strong south wind; current imperceptible.
24	32.20	32.50	0.30	....	.....	.....	Current changing.
25	32.00	32.40	0.40	.....	.....	.....	Current observations ceased.
26	31.85	32.30	0.45	....	.....	.....	
27	31.80	32.20	0.40	....	.....	.....	Departure for Black Hawk.
28	31.85	32.20	0.35	....	.....	.....	
29	31.95	32.20	0.25	....	.....	.....	
30	32.00	32.30	0.30	....	.....	.....	
31	32.05	32.40	0.35	....	.....	.....	

*No gauge.

TABLE No. 2.—*Showing areas and changes in areas above and below zero of Barbre's Landing gauge, and greatest depths sounded by W. M. Rees in* 1880, *H. St. L. Coppée in* 1881, *and A. Owen Wilson in* 1883.

ATCHAFALAYA RIVER.

Sections.	Areas above and below zero of Barbre's Landing gauge.						Changes from 1880 to 1881.			Changes from 1881 to 1883.		Greatest depths below zero of Barbre's Landing gauge.		
	1880.		1881.		1883.		Above zero—scour.	Below zero.		Above zero—scour.	Below zero—scour.			
	Above.	Below.	Above.	Below.	Above.	Below.		Fill.	Scour.			1880.	1881.	1883.
No. 2.....	49, 360	31, 930	50, 100	30, 380	57, 780	40, 020	740	1, 550	...	7, 680	9, 640	68. 7	60. 7	73. 5
No. 4.....	32, 320	6, 300	33, 220	6, 780	34, 800	8, 180	900	.....	480	1, 580	1, 400	35. 3	40. 0	75. 5
No. 6.....	33, 120	8, 400	33, 660	8, 100	35, 620	11, 420	540	300	...	1, 960	3, 320	27. 1	28. 8	30. 7
No. 8.....	31, 240	7, 920	31, 700	8, 360	33, 240	14, 660	460	.....	440	1, 540	6, 300	38. 2	37. 5	54. 6
No. 10.....	37, 640	11, 100	38, 260	11, 860	38, 960	15, 220	620	.....	760	700	3, 360	29. 7	32. 8	40. 7
No. 12.....	38, 500	11, 160	38, 860	11, 660	44, 100	14, 520	360	.....	500	5, 240	2, 860	39. 6	40. 8	37. 8

TABLE No. 3.—*Showing scour or fill on the line of the deepest water in the channel through Old and Lower Old rivers, according to the surveys of* 1880, 1881, *and* 1883.

Cross-section.	1880 to 1881.		1881 to 1883.		1880 to 1883.	
	Scour.	Fill.	Scour.	Fill.	Scour.	Fill.
A	.....	1.5	2.0	.....	0.5	.....
B	.....	1.5	.....	1.0	.....	2.5
C	0.5	.....	.....	3.5	.....	3.0
E	1.0	.....	.....	4.0	.....	3.0
F	6.0	.....	.....	2.0	4.0	.....
G	10.0	.....	.....	7.0	3.0	.....
I	10.0	.....	.....	8.5	1.5	.....
Z	4.5	.....	.....	14.0	.....	9.5
X	5.0	.....	.....	1.0	4.0	.....
K	8.0	.....	.....	5.5	2.5	.....
L	4.0	.....	.....	6.0	.....	2.0
M	0.2	.....	.....	5.5	.....	5.3
N	3.5	.....	.....	5.8	.....	2.3
P	8.0	.....	.....	6.0	2.0	.....
R	7.0	.....	.....	5.5	1.5	.....
S	8.0	.....	.....	3.0	5.0	.....
T	8.5	.....	.....	4.0	4.5	.....
V	5.0	.....	.....	4.0	1.0	.....
U	.....	18.0	.....	1.0	.....	19.0

"I am, very respectfully, your obedient servant,

"ARTHUR OWEN WILSON,
"*Assistant Engineer.*

"Maj. AMOS STICKNEY,
"*Corps of Engineers, U. S. A., New Orleans, La.*"

MONEY STATEMENT.

In Treasury Department, Washington, September 30, 1882		$75,000 00
Transfer September 30, 1882		8,153 94
Allotment July 22, 1884		12,290 00
Drawn	$83,571 26	
Transfer and deposit	571 26	
		83,000 00
Not drawn		4,290 00
On hand, assistant treasurer, New Orleans, La., September 30, 1884		17,821 42
In hands of assistants		388 00
Expended since September 30, 1882		72,944 52
Balance due from appropriation October 31, 1883		14,729 52
Received since October 31, 1883		61,571 26
Expended since October 31, 1883		28,632 32
Balance on hand September 30, 1884		18,209 42
Total appropriated	$190,000 00	
Allotment July 22, 1884	12,290 00	
		202,290 00
Total expended		179,790 58

IMPROVING HARBOR AT NEW ORLEANS, LOUISIANA.

At the time of last annual report work was in progress in Carrollton Bend. The work contemplated was the protection of the sloping river bank from low-water mark to the bottom of the river by means of a continuous mattress of brush and stone. To accomplish this it was intended to make the mattress in one piece 400 feet wide and about 10,000 feet long. Owing to unavoidable delay caused by the delinquency of contractors in furnishing material and a rise in the river, the weaving of mattress had to be suspended when a length of only 470 feet had been constructed. This was successfully sunk, but on account of insufficiency of ballast and a changing of the current a small portion of it came up and was lost. It was demonstrated, however, that a wide mattress could be placed in deep water when there was not a strong current. On the resumption of work, after the subsiding of the river, the location and method of protection were changed, the change of method being to suit the new locality where wharves render it impracticable to construct and maintain a mattress covering. The following is the project for the work:

"UNITED STATES ENGINEER OFFICE,
"*New Orleans, La., April 22*, 1884.

"SIR: In compliance with the resolution of the Commission of November 20, 1883, I have the honor to submit herewith a report of my assistant, Mr. W. G. Price, upon the relative importance of protecting the Gouldsborough Bend, in the harbor of New Orleans, as compared with other work contemplated in the project approved by the Commission. There is, I think, no question of the greater immediate importance of protecting Gouldsborough Bend, which is rapidly increasing. I believe that work should be commenced for preventing the caving of the banks at once, and have had a plan and estimates prepared by Mr. Price, assistant engineer, which, with the accompanying maps, is also presented herewith, as well as plan, maps, &c., for protecting the Gretna Bend, which is just above the Gouldsborough Bend, one being almost a continuation of the other. Owing to the difficulty of placing continuous mattress work on the banks on account of the standing and wrecked wharves, and the belief that mattress work would be destroyed by the collection of heavy deposits of sediment at all points where wharves were placed, I have had plans prepared for the protection of the bank by means of submerged spurs of brush and stone placed so as to throw the contour lines of the bank about 50 feet out into the river. I would propose to locate these spurs at the salient points of the deep-water lines. Experience in the first reach protected would in the first season show whether the spurs were properly placed, and if a greater number were needed to thoroughly protect the bank they could be added afterwards. The plans are based upon the survey of 1877–'78 and are intended to show in a general way the method of constructing and placing the spurs. A new survey will be made as soon as the stage of water will permit from which to determine the exact locations.

"The entire length of bank from opposite a point just above the City Park down to Algiers, as shown on accompanying map, will eventually need protection, but the greatest immediate need is in the lower bend in the front of Gretna and Gouldsborough, and more particularly in front of Gouldsborough where the caving is worse, and commercial interests greatest.

"The estimate for the Gouldsborough part is $64,200, and for the Gretna part $64,200, exclusive of plant. The plant required is about as follows:

6 barges, at $3,000 each	$18,000
To build mattress-ways on three of them	1,500
Ways built on the bank for constructing crib for spur	300
1 stern-wheel steamboat	15,000
Capstans, rope, and tools	3,000
Making a total of	37,800

"In making provision for this work I am of the opinion that the Carrollton work should not be suspended. The plant for that work is all ready. The method of working has been tried, and the experience gained is such that it is expected that the project as approved can be carried out as soon as the river reaches a proper stage.

"Very respectfully, your obedient servant,

"AMOS STICKNEY,
"*Major of Engineers, U. S. A.*

"Lieut. Col. C. B. COMSTOCK,
"*Corps of Engineers, U. S. A.,*
"*President Mississippi River Commission.*"

"NEW ORLEANS, *January* 3, 1884.

"MAJOR: I have the honor to make the following report on the relative importance of protecting the Gouldsboro' bank, in the harbor of New Orleans, as compared with other work contemplated in the project approved by the Mississippi River Commission. The work contemplated by the Commission in the project approved by them September 18, 1882, was to prevent further erosion of the bank in Carrollton Bend.

"IMPORTANCE OF CARROLLTON BEND WORK.

"From a comparison of surveys I find that the bank in this bend is cutting away at an average rate of 14 feet a year, and the cutting extends probably 5,000 feet below the bend, all of which would probably be stopped in a short time after the bank in the bend is protected. The caving amounts to about 4.8 acres a year, which, at $1,000 an acre valuation for land and improvements, would be $4,800. If the caving is not stopped there will have to be built during the next five years 6,000 feet of levee,

estimated to cost $25,000, or $5,000 a year. The only business interests that suffer from caving banks are the Picayune saw-mill and the Carrollton oil-mill. The loss to them if the bank is not protected would probably be $35,000 during the next five years, or $7,000 a year.

"From the above the total loss per year from caving of bank in Carrollton Bend is $16,800. There are no wharves in Carrollton Bend, and the improvement would be of little benefit to commerce and navigation at present.

"IMPORTANCE OF PROTECTING GOULDSBOROUGH BANK.

"From my report of November 19, 1883, the value of land and improvements in the Gouldsborough bend which will be lost in a few years if the bank is not protected was estimated to be $1,400,000. But this does not represent the whole interest at stake. The river front here is being used for purposes of commerce and navigation, and these interests suffer very much from the caving in of wharves, railroad inclines, and depots.

"The commercial interest is much greater than the value of property already located there, and its value cannot be estimated.

"COMPARISON.

"The caving of bank in Carrollton Bend causes a very small loss of property compared to what it does in Gouldsborough Bend. The commercial interests in Carrollton Bend are almost nothing, while in Gouldsborough Bend they are very great and are rapidly increasing. It is important that the work at Gouldsborough be done soon, as the number of wharves and vessels landing at them is increasing, and they make the work of improvement more difficult. In order to make the city of New Orleans secure from danger of breaks in the levee and from being gradually washed away it is necessary to protect the bank in Carrollton Bend; but the immediate importance of the work is small compared to what it is at Gouldsborough.

"Respectfully submitted.

"W. G. PRICE,
"*United States Assistant Engineer.*

"Maj. AMOS STICKNEY,
"*Corps of Engineers, U. S. A.*

"NEW ORLEANS, *April* 17, 1884.

"MAJOR: In accordance with your request, I have the honor to make the following report on the plan for protecting the caving bank in the Gouldsborough Bend, in New Orleans Harbor, with submerged spurs.

"The portion of the bend which is now caving badly, and which needs immediate protection, extends from Perriander street, in Gouldsborough, to Socrates street, in Algiers, and is about 5,000 feet long. The plan is to put down a number of submerged spurs each 300 feet long and built out at right angles to the bank; the spurs to be such a distance apart that the current deflected from one will reach the next before it strikes the bank. A mattress 350 feet by 200 feet will first be put down, and then four flexible brush cribs 5 feet high and 300 feet long, filled with rock, will be sunk one on another on the center line of the mattress, reaching to within 50 feet of the deep-water end of the mattress.

"METHOD OF CONSTRUCTING MATTRESS.

"The mattress will be constructed in position for sinking, and will be made of willow brush and poles, the brush to be woven on the poles, which will be 25 feet long and 8 feet apart, the longitudinal and transverse strength of the mattress to consist of iron rods, those which run parallel to the poles to be fastened to them, and to be in separate links of 25 feet, and joined with clevises; those which cross the poles to be made in a chain 350 feet long, with links of 8 feet, and to be connected with the clevises in the first system of rods; these chains to run through the mattress 25 feet apart, and to extend back on shore to logs sunk in the ground; the up-stream, down-stream, and deep-water edges of the mattress to be double in the thickness for a width of 8 feet, with a large quantity of rock between, which will be put in when the mattress is constructed. This will insure the ballasting of the edges of the mattress, and prevent their rising up and dumping the ballast. It is estimated that it will require 7.8 pounds of rock weighed in water to ballast a square foot of the mattress.

"METHOD OF CONSTRUCTING SPUR.

"In order to expedite the work so that it can be completed in one season it will be necessary to build the cribs at some point above, and float them down as they are needed for sinking. A few piles hauled out on shore will be sufficient ways for building the bottom of the crib. It can then be launched and finished on the water. It will be constructed of willow brush and poles, yellow-pine timber, and iron rods, leaving pockets into which the rock can be thrown for sinking it. The capacity of the pockets will be one-fourth of the size of the spur.

"It will be so constructed that when the iron rods rust away it will still hold together, and it will be so made that it can bend to the curve of the bank. The details of construction may have to be changed during the course of the work.

"METHOD OF SINKING SPUR.

"For sinking the spur two lines of barges will be required, one on each side of the spur; rock to be thrown in the crib until the pockets are full, and it will then be lowered to the bottom by ropes from the barges. To prevent the barges overturning, it will be necessary to build two longitudinal water-tight bulkheads in each, and the water will be let in on one side of the barge as the ropes pull down on the other. It may be necessary also to use a small quantity of rock as a counter-balance. The weight of a complete spur will sink one side of two 30-foot barges 2.4 feet.

"The buoyancy of a cubic foot of the spur will be about 7½ pounds, and to overcome this, and insure the stability of the spur, it will be necessary to use 15 pounds of rock weighed in water to the cubic foot of spur, which will require the spur to be constructed three-quarters of brush and one-quarter of stone. To give it increased stability, iron rods will run from the spur diagonally up-stream to the shore and be fastened to logs sunk in the ground.

"PLANT REQUIRED.

"The plant for the work should consist of six barges, each 30 by 124 by 7½ feet, decked, and containing two longitudinal water-tight bulkheads; three of the barges to have mattress-ways constructed on them, so that they can be placed end to end and a mattress 350 feet wide built on them. To do the necessary towing a steam-tug or stern-wheel steamboat will be required. The plant will be such that it can be used for any future mattress work in the harbor.

"COST OF THE WORK.

"To protect the bend at Gouldsborough, which is 5,000 feet long, it is estimated will require six submerged spurs. Calculating mattress to cost 4.13 cents per square foot, and the spur 5 cents per cubic foot—

Six submerged spurs will cost	$64,200
Six barges, at $3,000 each	18,000
To build mattress-ways on three of them	1,500
Ways built on the bank for constructing crib for spur	300
One stern-wheel steamboat	15,000
Capstans, rope, and tools	3,000
	102,000

"I present herewith the drawings accompanying this report.
"Respectfully submitted.

"W. G. PRICE,
"*Assistant Engineer.*

"Maj. AMOS STICKNEY,
"*Corps of Engineers, U. S. A.*"

"NEW ORLEANS, *April* 22, 1884.

"MAJOR: In accordance with your request I have completed a map of the Gretna Bend in New Orleans Harbor, showing the proposed improvement with submerged spurs. It is estimated that it will require six of these spurs to protect the bank in this bend; and estimating a spur to cost the same as given in my estimate for the protection in Gouldsborough Bend, it will require $64,200 for the work in Gretna Bend.

"No additional plant will be required.

"Very respectfully, your obedient servant,

"W. G. PRICE,
"*Assistant Engineer.*

"Maj. AMOS STICKNEY,
"*Corps of Engineers, U. S. A.*"

The necessity for protecting the bank in the Gouldsborough Bend being more pressing than that in the Carrollton Bend, the Commission authorized its commencement, which, on account of lack of sufficient funds, necessitated the stoppage of work at Carrollton.

The plan for the Gouldsborough protection is one which has not heretofore been tried on this river, but one from which I have strong hopes of good results. The main feature of the plan is the deflection of the current from the bank by means of spurs constructed of brush and stone. To prevent or lessen the eddies the spurs are submerged and sloping, and are placed on mattresses to prevent their being undermined.

The necessary working plant has been procured, contracts have been made for the material, and one spur is well under way.

Approximate estimate for completing work of improving harbor at New Orleans.

Carrollton Bend, left bank	$158,600
Gouldsborough portion of bend, right bank, 5,000 feet long	64,200
Gretna portion of bend, right bank, about 8,600 feet long	64,200
Bend above Gretna to a point nearly opposite the City Park, right bank, 26,400 feet	396,600
Total	683,600

The following report of Assistant Engineer W. G. Price is referred to for the details of the work:

"NEW ORLEANS, *October* 1, 1884.

"MAJOR: I have the honor to submit the following report of operations for the improvement of the harbor at New Orleans during the eleven months ending September 30, 1884:

"When I submitted my last report the work of protecting the caving bank in Carrollton Bend was in progress. The plan was to sink a continuous willow mattress 400 feet wide and 10,000 feet long. The contractor, Mr. George W. Davis, failed to furnish brush in sufficient quantities, which delayed the work to such an extent that on November 22 there were only 275 linear feet of mattress woven. On that date his contract was annuled, and arrangements for brush were made with Mr. J. H. Gardner. Under this arrangement some brush was received, and it was expected that work could be resumed with a strong force, but the rapid rise of the river made it hazardous to continue the construction of so large a mattress. All of the brush was woven in making a mattress 470 feet long.

"On December 7 preparations for sinking were commenced, and on the 12th the mattress was lowered to the bottom. Owing to a large quantity of drift-wood lodging under the mattress, considerable more rock was required than was expected, and as there was only a limited supply on hand, the last portion of the mattress to go down was not very heavily ballasted. During the night of the 12th a very strong current set in against this part and raised up a small portion of it.

"Additional rock was then purchased and part of this portion was forced down again; the remainder was torn to pieces by the current and floated away, about 4 per cent. of the mattress being lost.

"In sinking the mattress it was supported on the up-stream and down-stream edges by ropes to barges. These ropes were all marked with tags 4 feet a part. This made it possible to lower the edges of the mattress very evenly, as only 4 feet at a time was let out on each rope. The mattress was put down under great difficulties, as at times there was a very strong eddy which tended to twist the mattress out of shape. The success in putting down this mattress shows that it will be possible to put down a continuous mattress of that size, provided there are no large eddies. As there is a very strong eddy in Carrollton Bend when the river is rising, it will be necessary to stop work at such times. It also shows that to make sure of the mattress staying down and not curling up and beginning to break at the edges, it will be necessary to make the mattress double at the edge, with a heavy weight of rock between. A survey at Carrollton Bend was made during the month of November.

"It is estimated that to finish the protection of the bank in Carrollton Bend, which is now about 9,600 feet long, with a continuous mattress 400 feet wide, will cost $158,600.

"From a comparison of surveys the bank in this bend is now cutting away at an average rate of 14 feet a year, and the cutting extends about 5,000 below the bend, all of which would probably be stopped in a short time after the bank in the bend is protected. It is estimated that the total loss per year from caving of this bank is $16,800.

"There are no wharves, and the improvement would be of little benefit to commerce and navigation at present.

"In order to make the city of New Orleans secure from danger of breaks in the levee, and from being gradually washed away, it is necessary to protect the bank in this bend, but the immediate importance of the work is not so great as it is in other portions of the harbor.

"On November 19, 1883, in accordance with your order, I obtained the following information in regard to the caving banks, values of property and interests on the river front in Gouldsborough and Gretna:

"The bank along some parts of this front is caving badly. It is occupied for railroad termini, transfer facilities, warehouses, and similar constructions. These are all used for purposes of commerce and navigation, and they cannot be safely used unless the bank is protected. The value of property on this front is estimated to be $1,400,000. The interests at stake are far greater, and cannot be estimated. The length of the bank to be protected here is about 13,600 feet, but the work to be permanent must in time be carried round the whole bend, which is about 40,000 feet long. The protection adopted for Carrollton Bend is not suited for work in this bend, owing to the difficulty in laying a continuous mattress where there are wharves in constant use, and the probability that the mattress would be wrecked by the sliding down of wharves under which a bank of silt had collected. The improvement must be such that the slope of the bank from low-water mark to the bed of the river shall become about 3 to 1; then if a mass of silt collect under the wharves it will not be likely to slide down the bank and wreck the improvement.

"The protection proposed by you for this part of the harbor consists of a system of submerged spurs, built out at right angles to the bank, and from 500 to 1,600 feet apart.

"The spurs to be built out on a slope of 3 to 1 and to be such a distance apart that the current deflected from one will reach the next before striking the bank. It is estimated the cost of protection will be as follows, exclusive of plant:

Gouldsborough portion of bend (5,000 feet long)	$64,200
Gretna portion of bend (8,600 feet long)	64,200
Bend above Gretna (26,400 feet long)	396,600
Cost of protecting the whole bend	525,000

"The plant used in Carrollton Bend can be used for the work, and there will be required in addition three decked barges and a stern-wheeled tow-boat.

"It having been decided to begin the work of putting down submerged spurs at Gouldsborough, plans and estimates were prepared. Three decked barges were constructed by contract and delivered August 28. The plant in use last season has been improved and put in order for the new work.

"A survey of the Gouldsborough portion of the bend was completed in July. On August 23 the stern-wheel tow-boat Annie Kelley was purchased; she has been employed in towing barges of rock from Wilson's Point to Gouldsborough. On August 24 the plant was towed to Gouldsborough, and on the 29th the constructing of the first mattress was begun.

"The mattress for the spur is 200 feet wide, up and down stream, and extends 350 feet out in the river. Just above the center line of this there will be sunk, one on another, six cribs 5⅔ feet thick, the bottom one having a width of 60 feet and the top one a width of 20 feet. The bottom one will be short and they will increase in length so that the top of the last one will be on a slope of 3 to 1 from low-water mark. Owing to the slow delivery of material the mattress was not completed till September 12. On September 15 this mattress was successfully lowered to the bottom. It has cribs filled with rock attached to three sides of it. The crib on the upper side is inclosed so that the rock cannot get out of it. On September 20 the first crib was launched into the river. They are being constructed on ways which are built on the river bank. The first crib was ballasted and lowered to the bottom successfully on September 27.

"It is proposed to put down six spurs in the Gouldsborough portion of the bend, which it is thought will give all the protection required.

"Respectfully submitted.

"W. G. PRICE,
"*Assistant Engineer.*

"Maj. AMOS STICKNEY,
"*Corps of Engineers, U. S. A.*"

MONEY STATEMENT.

In Treasury Department, Washington, D. C., July 1, 1882		$144,525 90
Drawn	$136,000 00	
Transfer and deposit	12,826 25	
		123,173 75

Not drawn, September 30, 1884		$21,352 15
On hand, assistant treasurer, New Orleans, July 1, 1882		3,267 91
On hand, assistant treasurer, New Orleans, September 30, 1884		22,997 61
In hands of assistant to September 30, 1884		1,053 31
Available September 30, 1884		45,403 07
Balance due from appropriation, October 31, 1883		5,577 10
Received since October 31, 1883	$136,000 00	
Transfer and deposit		12,826 25
Expended since October 31, 1883		93,545 73
On hand September 30, 1884		24,050 92
		136,000 00
Total available since July 1, 1882		147,793 81
Total expended since July 1, 1882		102,390 74

Condensed list of plant for which Maj. Amos Stickney, Corps of Engineers, U. S. A., is responsible, and its present estimated value.

HARBOR AT NEW ORLEANS, LOUISIANA.

1 boat, steam (stern-wheel)	$14,125 00
1 boat, tug (steam)	4,500 00
1 launch (steam)	2,700 00
15 barges	21,500 00
1 barge, coal	40 00

MOUTH OF RED RIVER, LOUISIANA.

2 boats, quarter	$3,500 00

HARBOR AT NATCHEZ AND VIDALIA.

4 boats, flat	Almost valueless.

CUBITT'S GAP.

Total allotted	$300 00
Total drawn	300 00
On hand, assistant treasurer, New Orleans, La	162 86
Expended to September 30, 1884	137 14

OBSERVATIONS AT CARROLLTON.

Total allotted	4,500 00
Total drawn	4,500 00
Total expended	4,454 11
On hand, assistant treasurer, New Orleans, La	49 89

UNLEVEED FRONTS.

Total allotted	1,000 00
Total drawn	1,000 00
Total expended	902 12
On hand, assistant treasurer, New Orleans, La	97 88

Very respectfully, your obedient servant,

AMOS STICKNEY,
Major of Engineers, U. S. A.

Lieut. Col. C. B. COMSTOCK,
Corps of Engineers, U. S. A.
President Mississippi River Commission.

APPENDIX K.

REPORT OF CAPTAIN E. H. RUFFNER, CORPS OF ENGINEERS, UPON THE IMPROVEMENT OF THE MISSISSIPPI RIVER BETWEEN THE DES MOINES RAPIDS AND THE MOUTH OF THE ILLINOIS RIVER.

UNITED STATES ENGINEER OFFICE,
Quincy, Ill., October 17, 1884.

SIR: In compliance with your circular calling for an annual report of the operations in the "improvement of the Mississippi River between the Des Moines Rapids and the mouth of the Illinois River," up to October 1, 1884, I have the honor to forward herewith copy of the annual report of Maj. A. Mackenzie to July 1, 1884, and to supplement his report by a brief one of my own, to cover the period from July 1 to October 1, 1884.

Understanding it to be your wish that the report be as concise as possible, I have not forwarded the reports of Major Mackenzie's assistants, which can be sent you if desired.

Having reported at Rock Island, Ill., August 14, and assumed charge, after an inspection of the river, on September 1, I am really only able to report of the intervening period to end of September; but as the principal work was done that month, perhaps all that is required will be found.

Very respectfully, your obedient servant,

E. H. RUFFNER,
Captain of Engineers.

IMPROVEMENT OF THE MISSISSIPPI RIVER FROM DES MOINES RAPIDS TO MOUTH OF ILLINOIS RIVER.

With this general appropriation works for the benefit of through navigation are carried on at localities selected each year as being in greatest need of improvement.

During the past fiscal year improvements have been carried on by formal contract at Louisiana, Mo., and Quincy, Ill., by informal agreement at Gilbert's Island and vicinity, and by aid of the Government plant at Alexandria, Quincy, Marion City, Hannibal, Canton, Howard's, Gilbert's Island, Denmark Island, and Dardenne Island.

The details of this work are given in the reports of Assistants Meigs, Hoffman, Durham, and Chaffee. Allotments have been made from this appropriation for the snagboat service, the removal of wrecks, surveys, and additions to plant.

The work at all points, excepting Howard's, has been of the same character as that heretofore carried out and fully described in previous reports. At Howard's Bar, between Canton and La Grange, Mo., a Government dredging outfit was used in connection with the formation of a new channel and the construction of dams. Howard's (or Smoot's) Crossing, always one of the worst between Keokuk and Saint Louis, threatened, during the fall of 1883, to seriously interfere with navigation. A cut about 1,000 feet long, 110 feet wide, and of a depth of 5 feet at extreme low water, was made through the bar in about a week, and at comparatively small expense.

Eleven thousand one hundred and ninety cubic yards of material were removed by the dredge. This cut remained open and furnished a good channel throughout the season of low water.

After the completion of the cut the dredge supplied, from a gravel bar, material for the construction of two wing-dams similar to the one constructed at Hannibal in the spring of 1883.

While the first wing-dam was under construction the swift current caused the gravel to spread over a very wide area, and to obviate this waste of material appliances for checking the current during time of construction were subsequently used. The small amount of money available for work during the year and the late day at which it was permissible to make use of the Government dredge cut short the season of operations in the vicinity of Howard's, but enough work was done to fully establish the fact that dams can be constructed of gravel more rapidly and at a much less cost than those built of brush and rock. This class of work will be resumed when future appropriations will permit, and before the close of the present season it is expected that important results and information will be secured.

Trouble being anticipated at Mundy's Crossing, 18 miles below Hannibal, during the period of low water of last season, a cut 60 feet wide, 6 feet deep, and about 200 feet long was made in thirty-six hours by a hired dredge. After this cut was opened no difficulty was experienced at this point.

The experience of the past season has shown that much assistance can be given to navigation by this kind of work, which, though temporary in a certain sense, is likely to be permanent for one season, if not longer. By the temporary use of dredges

at an expense so comparatively small as to be fully justifiable, I have no doubt a good navigable channel can be maintained during the low-water season on this stretch of the river, and if the navigation of the river is to be continued with success by steamboats, such temporary aid must be given until such time as the permanent channel improvement is completed. It is proposed to furnish as much aid in this direction during the coming season as circumstances permit.

The funds available have not permitted work to be carried on during the past year at the Government quarry at Dixon's Landing, but a portion of the rock in store at that point was used in connection with improvements near Quincy, Ill. A large amount of rock is still on hand, and will be used during present season. This quarry is an important adjunct of the work of river improvement, insuring as it does, when other sources fail, a steady and ample supply of rock at a reasonable cost.

The greater part of the work of the past fiscal year was carried out late in the season of 1883, and results attained cannot be given until the low-water season of present year arrives.

At points where former improvements were made, no trouble has been experienced during the past year, even at the lowest stages. A sketch showing the favorable results attained below the Louisiana Bridge is appended.

The system of improvement now being carried out between the Des Moines Rapids and the mouth of the Illinois River, which consists in closing side chutes and reducing the stream to a uniform width, will in time accomplish all the results claimed for it, and that this system is generally indorsed, and has greatly benefited commerce, is conclusively shown by the report of the select Senate committee, published in Senate Doc. No. 36, Forty-second Congress, first session.

The point which is now especially aimed at is such improvement in the methods of constructing wing and closing dams and shore protections as will reduce their original cost, and do away with the expense attending repairs, &c., and at the same time admit of more rapid construction.

No funds have been available for resuming work in 1884, excepting in the vicinity of Quincy, Ill. During the past winter the plant pertaining to this appropriation has been put in good order, and is now ready for use.

Summary of expenditures for fiscal year ending June 30, 1884.

Quincy revetment	$24,325 47
Vicinity of Louisiana	44,890 71
Repairing dam at Alexandria	1,619 92
Marion City and Hannibal	13,934 83
Repairs at Gilbert's, Denmark, and Dardenne islands	23,987 04
Dredging and building gravel dams at Howard's	5,613 50
Quincy (dams 1, 2, and 3)	1,577 54
Repairs at Canton and Smoot chutes	4,592 56
Removing wrecks at Hamburg, Keokuk, and Quincy	1,332 07
Purchase and repairs of plant	15,018 36
Snag-boat General Barnard	348 33
Surveys and gauges	502 12
	137,742 45

NOTE.—Of above amount, $5,978.82 was reported as outstanding liability July 1, 1883.

Expenditures on the various sections of the river between Des Moines Rapids and the mouth of the Illinois River from commencement of improvement to July 1, 1884.

Des Moines Rapids to Quincy Bridge (40 miles)	$80,653 58
Quincy Bridge to Saverton (25 miles)	49,352 76
Saverton to Louisiana Bridge (25 miles)	198,703 77
Louisiana Bridge to Hamburg (25 miles)	96,788 04
Hamburg to Illinois River (48 miles)	41,968 30
Surveys and gauges	38,363 35
Snag-boats and wrecking	23,784 36
Material and Government quarry	29,538 82
Plant at estimated value	43,253 78
	602,406 76

As the Government is now provided with the plant and outfit needed for carrying on extensive operations, and as an economical method of working requires liberal appropriations, it is hoped that this section of the river may be granted the sum of $1,000,000 for the fiscal year ending June 30, 1886.

ABSTRACT OF APPROPRIATIONS.

By act approved June 18, 1878	$100,000
By act approved March 3, 1879	40,000
By act approved June 14, 1880	100,000
By act approved March 3, 1881	175,000
By act approved August 2, 1882	200,000
	615,000

A true copy.

A. MACKENZIE,
Major of Engineers.

A true copy.

E. H. RUFFNER,
Captain of Engineers.

Lieut. Col. C. B. COMSTOCK,
Corps of Engineers,
President Mississippi River Commission.

IMPROVING MISSISSIPPI RIVER BETWEEN DES MOINES RAPIDS AND MOUTH OF ILLINOIS RIVER, JULY 1, 1884, TO OCTOBER 1, 1884.

(Major A. Mackenzie, Corps of Engineers, in charge to September 1, Captain E. H. Ruffner, Corps of Engineers, in charge September 1 to October 1.)

During July no new work was done, the operations in construction being confined to the raising and repairing of the dams opposite Quincy, Ill., known as 2.68 and 3.68, in which works were used 1,438 cubic yards of stone.

The project of expenditure for the new appropriation having been approved August 1, work was begun first by continuing the shore protection of Buffalo Island, below Louisiana Bridge, under the contract with Patterson Bros., dated November 9, 1882, and the raising of a low place in the wing-dam built from the shore opposite the foot of Buffalo Island. This work was satisfactorily completed August 30. An agreement was made with Mr. H. L. Brown, at 25 cents per cubic yard for dredging gravel and putting in a foundation 3 feet deep for a closing dam between Brokan Island and the Illinois shore. This work began in August and was finished October 15, and the material used amounted to—

19,760 cubic yards, at a cost of	$4,940
15 piles, at a cost of	60
	5,000

To complete this work, that is to put in the shore protection at the head of Brokan Island and the brush and stone dam on top of this foundation, bids were opened September 1, 1884, of which the following is the abstract:

Number.	Names and residences of bidders.	10,000 cubic yards of stone.		8,000 cubic yards of brush.		Aggregate.
		Price per cubic yard.	Amount.	Price per cubic yard.	Amount.	
1	Fruin, Bambric & Co., Saint Louis, Mo	$1 49	$14,900	$0 80	$6,400	$21,300
2	H. McPherson & Co., Boonville, Mo	1 49	14,900	85	6,800	21,700
3	C. S. Whitney, Keokuk, Iowa	1 35	13,500	90	7,200	20,700
4	A. J. Whitney, Keokuk, Iowa	1 49	14,900	80	6,400	21,300
5	N. S. Brown, Quincy, Ill	1 40	14,000	91	7,280	21,280
6	Patterson Bros., Keokuk, Iowa	1 35	13,500	65	5,200	18,700

Contract was made with Patterson Bros., of Keokuk, Iowa, for this work at the above figures, and work began at once, September 24, and some small amount was done before the close of the month. Mr. J. C. McElherne has acted as the inspector for the works in this vicinity, and will for the new work contracted for by Messrs. Patterson.

On August 3 instructions were given Assistant Engineer E. F. Hoffman to begin work with United States dredge No. 2, tow-boats 3 and 4, and suitable barges, &c., on a closing dam between the Illinois shore and the island, No. 421, opposite La Grange. This work was in immediate charge of Assistant Engineer W. A. Thompson; Assistant Engineer Hoffman died August 13. After that time Assistant Engineer O. N. Chaffee exercised a general supervision over this work, as well as over that done by the Coal Bluff and plant.

The closing dam was built somewhat differently from ordinary, there being a line of piles and sheet piling used as principal obstruction to the flow of water through the slough. Strengthened by the use of mats, gravel, and of stone, it was hoped the dam would answer its purpose, and be more economical than other methods used. Time will show as to this. This dam was completed September 17. A wing-dam was then begun, about 2,000 feet below wing-dam 3.66, half way between Canton and La Grange, and was fairly under way at the close of the month. The effects of these new works are not as yet evident, owing to their recent construction and continued high water, but it may be said that the bar above La Grange is evidently cutting and the channel straightening.

The steamer Coal Bluff (U. S. No. 5) was prepared for service September 1, and started from Keokuk for work near Dixson's Landing with part of her plant. It was found, however, that she leaked badly and she was placed on the ways at Quincy. This, and a delay in getting her off from the ways, postponed the beginning of the work until the middle of the month. Since then she has been engaged in putting in shore protection at Bolter's Island, and in preparing to put in a dam from the island to the tow-head, a work which will be about 300 feet long. This work is under the immediate charge of Assistant Engineer C. M. Bennett.

Continuous high water in September and since then has made the works of construction more tedious and expensive than usual, and have hindered necessary surveys to determine the effects of previous works.

Assistant Engineer O. N. Chaffee has assisted me in the purchase of supplies, the inspection of work and the general management of working parties, and in carrying out the plans of Major Mackenzie, as set forth in the approved project.

Bids were opened September 5 for dredging in Quincy Bay in accordance with the terms of the appropriation, which allotted $12,500 for this purpose. The contract was assigned to H. S. Brown, after C. L. Williams who had made an equally low bid, had resigned in his favor.

The abstract of proposals is given below:

Number.	Names and residences of bidders.	For dredging and removing material to a distance not exceeding 1 mile. Approximate quantity, 15,000 cubic yards.	For dredging and removing material to a distance exceeding 1 mile, and not exceeding 2¼ miles. Approximate quantity 45,000 cubic yards.	Total.
		Per cubic yard.	*Per cubic yard.*	
1	J. W. Heisey, Burlington, Iowa	$0 15	$0 21	$11,700 00
2	C. S. Whitney, Keokuk, Iowa	19⅞	21	12,421 25
3	C. L. Williams, Keokuk, Iowa	14	14	8,400 00
4	A. J. Whitney, Keokuk, Iowa	12	15	8,550 00
5	H. S. Brown, Quincy, Ill	14	14	8,400 00
6	B. E. Linehan, Dubuque, Iowa	22	23	13,650 00

ESTIMATED VALUE OF PLANT.

Coal Bluff, United States tow-boat No. 5	$10,000
6 new barges, at $3,000	18,000
3 old barges, at $1,200	3,600
1 old barge	500
1 coal flat	1,200
1 pile-driver and tender	1,800
3 quarter-boats, two at $1,800 and one at $500	2,300
1 launch, Irene	1,500
1 dredge, United States No. 2	25,000
6 dump boats, at $1,000	6,000
	69,900

FINANCIAL STATEMENT.

Appropriation, July 5, 1884		$200,000 00
Amount expended to October 1, 1884	$18,251 35	
Amount contracted for with Patterson	18,700 00	
Amount contracted for with H. S. Brown	8,400 00	
		45,351 35
Balance available October 1, 1884		154,648 65

APPENDIX L.

REPORT OF MAJOR O. H. ERNST, CORPS OF ENGINEERS, UPON THE IMPROVEMENT OF THE MISSISSIPPI RIVER BETWEEN THE MOUTHS OF THE ILLINOIS AND OHIO RIVERS.

UNITED STATES ENGINEER OFFICE,
Saint Louis, Mo., October 17, 1884.

SIR: In compliance with the instructions contained in your circular of September 17, 1884, I have the honor to submit the following annual report for works executed from funds controlled by the Mississippi River Commission, the report being brought down to October 1, 1884, "for the portion of the river under my charge, viz, between the Illinois and Ohio rivers."

This portion of the river came under the control of the Commission by a provision in the river and harbor act of July 5, 1884. Up to that time operations had been carried on under the Chief of Engineers, United States Army, being regularly described in my annual reports, the last of which gives their history for the fiscal year ending June 30, 1884. Upon the 8th of August I received notice that my project for the expenditure of the new appropriation, the first one under the control of the Commission, was approved. At that time the works had been suspended for about two months, nearly all supplies had been exhausted, and the laboring force was disbanded. Although preparations for the procurement of supplies and the reorganization of the force had already been begun, and no time has since been lost in this office, these preparations are not even yet entirely completed. The works under the new appropriation may therefore be said to be only fairly inaugurated. My report upon this occasion will therefore necessarily be brief. The works consisted entirely of the repair or extension of those begun in former years, with the exception of the one at Cairo, Ill.

ALTON.

The dike opposite and above the landing at Alton had accomplished the desired result of improving the landing, but there had been considerable settling in some portions of it. To preserve its efficiency it was considered desirable to fill up the depressions, and to raise the general level of its crest to the height originally fixed upon—14 feet above low water. This work was begun in August. By the 1st of October a length of about 1,680 feet had been raised to the required height, and good progress had been made in raising other portions. The work was temporarily suspended at that time, on account of high water. The expenditures were $4,915.40, making the total cost of the dike to that date $72,240.10.

ARSENAL ISLAND.

The protection of the west side of Arsenal Island had been put in at various dates, beginning with 1877. The portion near the head of the island was unprovided with a mattress at the foot of the slope. It was considered necessary to place such a mattress, in order to secure the old work from injury, and an extension of the whole, about the head of the island, had become necessary. The work was begun August 12, and completed September 19. A mattress 120 feet wide and 1,283 feet long was placed below low-water mark, its up-stream extremity being about 300 feet above the terminus of the old work. Riprap was deposited upon the bank, above low water, over this length of 300 feet, and about the head of the island to a distance of about 100 feet on its eastern side.

HORSETAIL.

The new bank built up by the work of former years, upon the west or Missouri side of the river, had been partially protected on its channel side, the mattress having been placed at the foot of the slope, and riprap deposited above low-water mark

to a height of about 6 feet. This protection has been extended this season to a height of about 21 feet above standard low water, for a length of about 1,150 feet. A portion (about 360 cubic yards) of the stone used was obtained from the old dike No. 1. Upon the Illinois side, the two new hurdles, called 27½ and 29½, which had been constructed to a length of 1,325 and 1,450 feet, respectively, from the Illinois shore, were extended to their full length of 2,055 and 2,135 feet, respectively, and were nearly completed. A new hurdle, to be called No. 31, was laid out about 1,000 feet below No. 30, but only a few piles (eight) had been driven October 1. The good results heretofore secured have been maintained during the recent low-water season, the least depth found being 9 feet.

TWIN HOLLOWS, WEST SIDE.

Very heavy deposits were secured at this locality during the summer rise. Some repairs were required in the primary hurdle and in secondary hurdles 1, 4, and 5. Those in No. 1 were completed, and those in the primary hurdle nearly completed, and those in No. 4 were begun. The good results heretofore secured by these works, in connection with those at Pulltight, were maintained throughout the recent low-water season, the least depth found in the channel being 9 feet. The lower crossing has been pushed down-stream sufficiently far to justify the beginning of another secondary hurdle, No. 6. The process of straightening the channel is working very favorably.

TWIN HOLLOWS, EAST SIDE.

The river having shown a tendency to attack the bank at a point lower down than where the protection of former years had been placed, it became necessary to extend the latter down-stream. This work was begun early in September. A mattress 120 feet wide, to be placed below low-water mark, was begun, and by the 1st of October had reached a length of 990 feet. The old work stands intact.

PULLTIGHT.

Work at this locality was begun in the latter part of August. Hurdle No. 5, which required only the wattling to finish it, was completed, and No. 4, 1,770 feet long, was begun and by the 1st of October was well advanced towards completion. These works have contributed towards the good results above reported for Twin Hollows, west side.

"JIM SMITH'S."

The most extensive works of the season are being carried on at this locality, but as they consist simply of reconstructing the old hurdles and decreasing the interval between them, by the construction of new ones midway between the old; they may be described in small space.

Work has been prosecuted upon Nos. 3½, 4, 4½, 5, 5½, 6, 6½, 7, and 7½. Of these, 4, 4½, and 5 were well advanced toward completion on 1st of October; 3½ and 6 were only fairly begun, and good progress had been made upon the others. The least depth found in the channel during the recent low-water season was 7½ feet and was found opposite Chesley Island.

CAIRO PROTECTION.

The river and harbor act of July 5, 1884, in the item appropriating $520,000 for this district, provided as follows, viz: "$50,000 of which sum shall be used in extending the works for the protection of the easterly bank of the Mississippi River at Cairo, Ill., and the prevention of its wash or erosion, commencing at the southerly end of the present Government revetment work, and continuing down-stream." The locality thus specifically described is shown upon the inclosed sketch. A series of spur-dikes were constructed here some thirty years ago by the Cairo Land Company. They have had the usual effect of spur-dikes built in a rapid-flowing stream with a soft bottom. Deep excavations have been made between them, and in the case of two or three at the up-stream end of the series, they have been cut off from the bank and have disappeared. Those that remain have been the subject of repair at intervals ever since their construction, and large quantities of stone have been placed upon the bank between them. These re-enforcements have usually been made under pressure, when the river was high and threatening. The material was thrown in where it seemed to be most required, without much system, and without any record of where it was deposited. It is uncertain how much of the slope below the water-surface is covered, but it is to be supposed that much of that between the spurs is not safe from undermining. It was accordingly determined to place a continuous mattress of the

standard width 120 feet outside of and embracing all the spurs and intervals between them, the inner edge of the mattress being placed as nearly as practicable on the low-water line. The jagged outline of the bank rendering necessary sharp curves in the mattress, and the swift currents about the ends of the spurs having a velocity in some cases of 8 feet per second, have made this a difficult piece of work. By the 1st of October the mattress had reached a length of 1,012 feet, of which 250 feet at the up-stream end had been sunk. The cash expenditures were $5,511.51, to which should be added $1,916.67 for the use of plant.

The cash expenditures for the works other than Alton and Cairo were $77,612.23. As these works are being carried on with one plant, and are being supplied from a single base, it is impracticable to give the expenditures for each one separately within the time fixed for rendering this report, viz, October 20.

Very respectfully, your obedient servant,

O. H. ERNST,
Major of Engineers.

Lieut. Col. C. B. COMSTOCK.
Corps of Engineers, U. S. A.,
President Mississippi River Commission.

Estimated value of plant October 1, 1884.

Steamer Humphreys	$20,663 45
Steamer Gillmore	19,360 25
Launch Hornet	224 96
Launch Florence	775 00
Barges, barge flats	42,098 07
Pile-drivers	39,867 15
Quarters, shops, &c	29,571 65
Quarter-boats	4,713 48
Skiffs, &c	7,662 18
Tools and appliances	6,950 92
Hydraulic excavator	5,825 63
Ways for mattresses	4,081 69
Photographic apparatus	339 51
Office furniture	905 87
Surveying instruments	1,101 67
Boarding outfit	12,692 14
Total	196,833 62

APPENDIX M.

REPORT OF THE BOARD OF ENGINEER OFFICERS UPON THE ALLOTMENT OF FUNDS FOR THE PRESERVATION AND REPAIR OF UNITED STATES LEVEES ON THE MISSISSIPPI RIVER.

UNITED STATES ENGINEER OFFICE,
Memphis, Tenn., August 27, 1884.

SIR: The Board of Engineer Officers convened by Special Orders No. 100, headquarters Corps of Engineers, United States Army, Washington, D. C., August 11, 1884, to make recommendations for the division of the remaining $160,000 of the allotment for the preservation and repair of levees among the United States levees on the Mississippi River needing repairs and completion, have the honor to make the following report:

The Board met at Memphis, Tenn., August 25. It consisted of Maj. Amos Stickney and Capt. C. B. Sears; Maj. A. M. Miller, Corps of Engineers, having been relieved from the Board by Special Orders No. 188, headquarters of the Army, Adjutant-General's Office, Washington, D. C., August 12, 1884.

The Board remained in session three days, carefully considering the whole question before it, and listening to written and verbal statements and petitions laid before it by the engineers and members of the various State Levee Boards and representative citizens of the various places along the river immediately interested in levee work.

From the best obtainable data it was found that for the repairs in United States levees, to close gaps only, and to provide for raising the Lake Concordia Levee 1 foot, made necessary by the King's Point Cut-off, there would be required the following amounts of earthwork, viz:

YAZOO FRONT, SECOND DISTRICT.

	Cubic yards.
Garth and McCloud breaks	140,000

TENSAS FRONT, THIRD DISTRICT.

Duffin break	20,000
Panther Forest	271,000
Raleigh to Willow Point	186,000
Delta to Bedford	24,000
Total	501,000

TENSAS FRONT, FOURTH DISTRICT.

Point Pleasant breaks	30,000
Ship's Bayou to Hard Times	43,139
Hardscrabble to Bondurant	177,388
Kempe Levee	108,119
Lake Concordia	150,000
Total	508,646

A total yardage of 1,149,646 cubic yards, estimated to cost $345,000.

Having only $160,000 with which to accomplish this work, the Board thought best to throw out such breaks as could not be filled entirely, and which by being only partially filled would be of little good by reason of breaks above or below.

The Board recommends, therefore, the following division and allotment of the $160,000, provided the Levee Board of the first levee district of Mississippi is enabled and will guarantee to expend $500,000 on its levees in said district. In case, however, guarantees for the expenditure of this amount are not given by September 10, 1884, or, in case it be definitely stated by the Levee Board of said district, or its engineer, before said date, that it will be unable to expend the amount of $500,000, then it is recommended that this $20,000 aforesaid shall be allotted for repairs to United States levees in the Yazoo Front, third district.

For preservation and repairs to United States levees in Tensas Front, third district, $50,000.

For preservation and repairs to United States levees, Tensas Front, fourth district, $90,000.

AMOS STICKNEY,
Major of Engineers, U. S. A.
CLINTON B. SEARS,
Captain of Engineers, U. S. A.

The CHIEF OF ENGINEERS, U. S. A.,
Washington, D. C.

BSB Bayerische StaatsBibliothek
MDZ Münchener DigitalisierungsZentrum Digitale Bibliothek

House documents

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